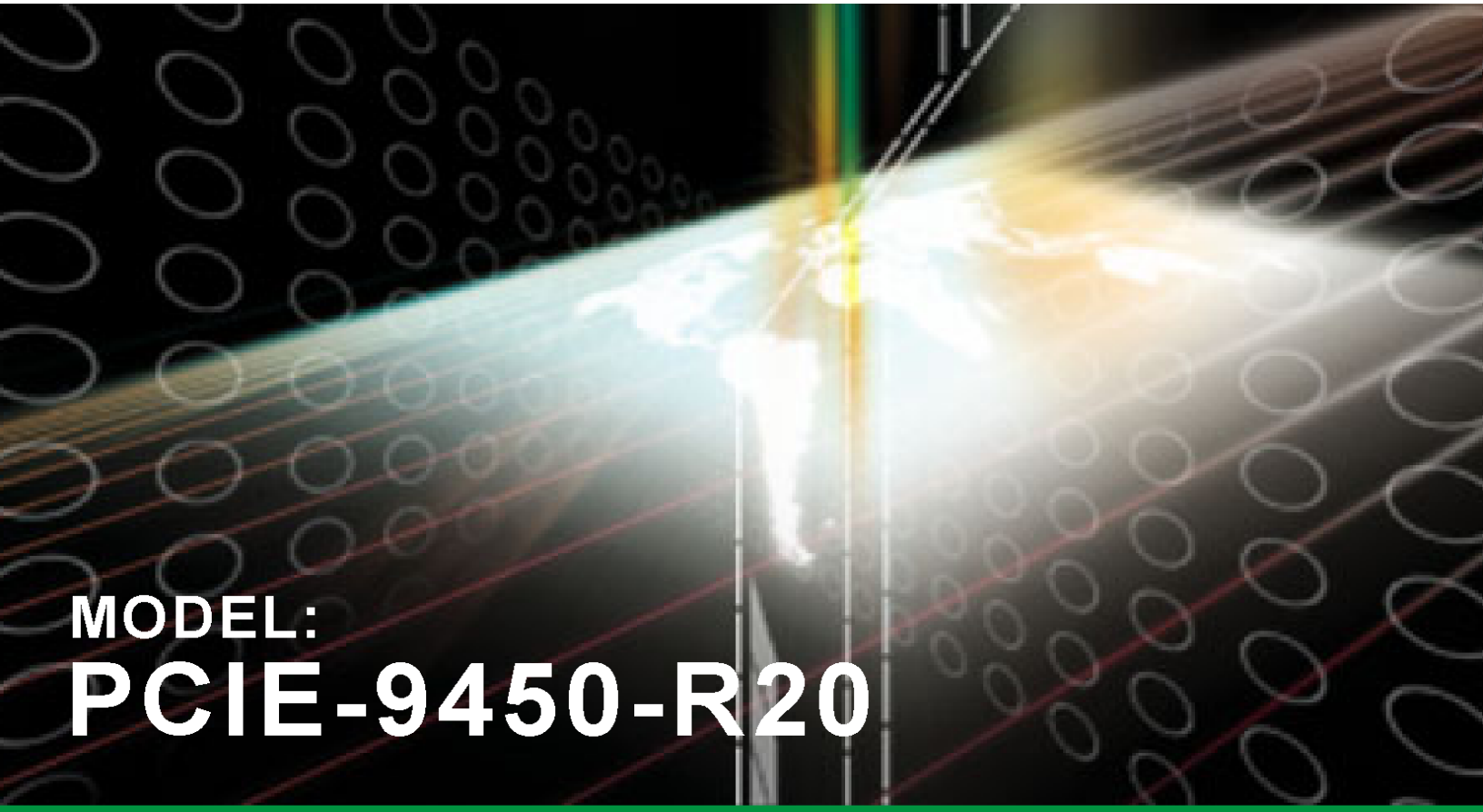
IEI Technology Corp.



MODEL:

PCIE-9450-R20

PICMG 1.3 LGA775 Intel® Core™2 Duo/ Pentium® D/4 CPU Card with VGA, USB, Dual PCIe, GbE and SATA II

User Manual

Rev. 1.01 May 2007

RoHS Lead Free

Revision

PCIE-9450 CPU Card		
Date	**Version**	**Changes**
March 2007	1.00	Initial release
May 2007	1.01	Keyboard and mouse connector (CN2) changed from 6-pin to 5-pin keyboard only connector

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Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the PCIE-9450 CPU card from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the PCIE-9450 CPU card package.

- 1 x PCIE-9450 single board computer
- 1 x ATX-12V cable (P/N: 32100-087100-RS)
- 1 x Mini jumper pack (P/N: 33100-000079-RS)
- 1 x ATA 66/100 flat cable (P/N: 32200-000052-RS)
- 4 x SATA cable (P/N: 32000-062800-RS)
- 2 x SATA power cable (P/N: 32100-088600-RS)
- 1 x KB/MS Y cable (P/N: 32000-000138-RS)
- 1 x RS-232 cable (2 COM Ports) (P/N: 19800-000051-RS)
- 1 x USB cable (P/N: CB-USB02-RS)
- 1 x Utility CD (P/N: IEI-7B000-000087/CD1)
- 1 x Quick installation guide (QIG) (P/N: 51000-001083-RS)

Images of the above items are shown in **Chapter 3**.

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Glossary

AC ’97	Audio Codec 97
ACPI	Advanced Configuration and Power Interface
APM	Advanced Power Management
ARMD	ATAPI Removable Media Device
ASKIR	Shift Keyed Infrared
ATA	Advanced Technology Attachments
BIOS	Basic Input/Output System
CFII	Compact Flash Type 2
CMOS	Complementary Metal Oxide Semiconductor
CPU	Central Processing Unit
Codec	Compressor/Decompressor
COM	Serial Port
DAC	Digital to Analog Converter
DDR	Double Data Rate
DIMM	Dual Inline Memory Module
DIO	Digital Input/Output
DMA	Direct Memory Access
EIDE	Enhanced IDE
EIST	Enhanced Intel SpeedStep Technology
FDD	Floppy Disk Drive
FDC	Floppy Disk Connector
FFIO	Flexible File Input/Output
FIFO	First In/First Out
FSB	Front Side Bus
IrDA	Infrared Data Association
HDD	Hard Disk Drive
IDE	Integrated Data Electronics
I/O	Input/Output
ICH7R	I/O Controller Hub 7
L1 Cache	Level 1 Cache
L2 Cache	Level 2 Cache
LCD	Liquid Crystal Display
LPT	Parallel Port Connector
LVDS	Low Voltage Differential Signaling
MAC	Media Access Controller
OS	Operating System
PCI	Peripheral Connect Interface
PIO	Programmed Input Output
PnP	Plug and Play
POST	Power On Self Test
RAM	Random Access Memory
SATA	Serial ATA
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology
SPD	Serial Presence Detect
S/PDI	Sony/Philips Digital Interface
SDRAM	Synchronous Dynamic Random Access Memory
SIR	Serial Infrared
UART	Universal Asynchronous Receiver-transmitter
USB	Universal Serial Bus
VGA	Video Graphics Adapter

Chapter

1

Introduction

1.1 PCIE-9450 Overview

The PCIE-94500 (PCIE-9450) PICMG 1.3 form factor CPU card is a Socket LGA 775 Intel® Core™ 2 Duo/Socket LGA 775 Intel® Pentium® 4/Socket LGA 775 Intel® Pentium® D/Socket LGA 775 Intel® Celeron® D CPU platform with an Intel® 945G Express Chipset and Intel® I/O Controller Hub 7 (ICH7R) Southbridge. The PCIE-9450 has a maximum front side bus (FSB) frequency of 1066MHz, supports up to 4GB of dual channel 677MHz DDR2 RAM and comes with a VGA interface and dual Broadcom PCI Express Gigabit Ethernet (GbE). The PCIE-9450 supports up to four serial ATA (SATAII) hard disk drives (HDD) with maximum transfer rates of 3.0Gb/s and up to seven USB 2.0 devices. Intel® Matrix Storage Technology provides data protection with support for RAID 0, 1, 5 and 10. Optional 5.1 and 7.1 channel audio kits are available for the system and can be purchased separately.

1.1.1 PCIE-9450 Features

Some of the PCIE-9450 features are listed below.

- RoHS compliant PICMG 1.3 form factor
- Support for the following CPUs:
  - Socket LGA 775 Intel® Core™ 2 Duo
  - Socket LGA 775 Intel® Pentium® 4
  - Socket LGA 775 Intel® Pentium® D
  - Socket LGA 775 Intel® Celeron® D
- Maximum FSB of 1066MHz
- Four 240-pin dual channel 400/533/677MHz DDR2 SDRAM DIMMs support up to 4GB of memory
- High performance PCIe Gigabit Ethernet chipset
- Four SATA drives with transfer rates of 3.0Gb/s supported
- Two Ultra ATA 100, Ultra ATA 66 or Ultra ATA 33 IDE HDDs supported
- Seven USB 2.0 devices supported
- Support PCIe x 16 Graphic Card, Four PCIe x 1 and four PCI expansion
- Optional 5.1 and 7.1 channel audio kits supported

1.2 PCIE-9450 Overview

1.2.1 PCIE-9450 Overview Photo

The PCIE-9450 has a wide variety of internal and external peripheral connectors. The peripheral connectors are connected to devices including storage devices, display devices and parallel communications devices. A labeled photo of the peripheral connectors is shown in **Figure 1-1**.

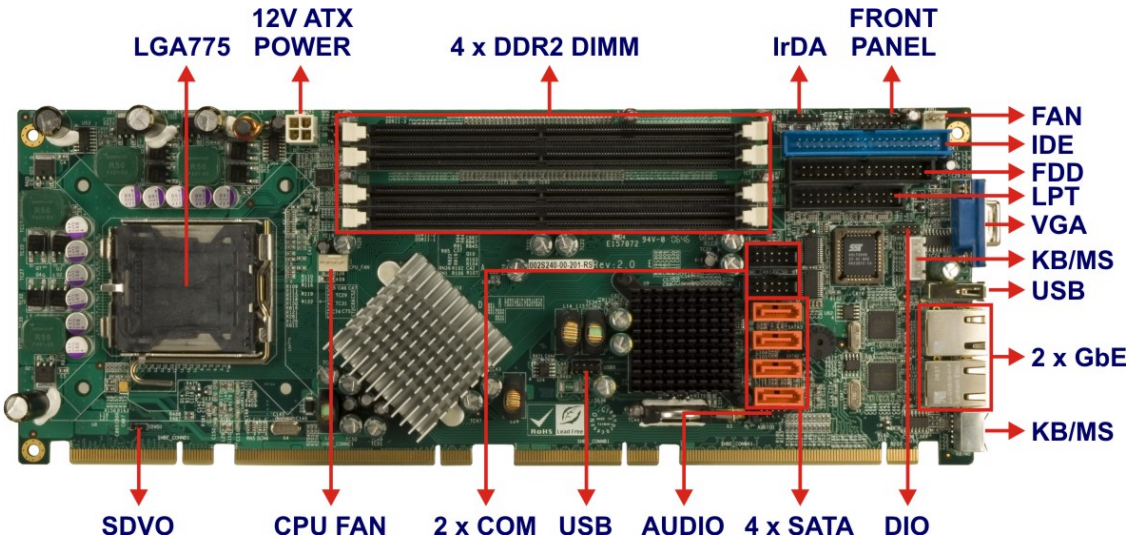

Figure 1-1: PCIE-9450 Overview

1.2.2 PCIE-9450 Peripheral Connectors and Jumpers

The PCIE-9450 has the following connectors on-board:

- 1 x ATX 12V power connector
- 1 x Audio connector
- 4 x DIMM slots
- 1 x DIO connector
- 2 x Fan connectors
- 1 x Floppy disk connector
- 1 x Front panel connector
- 1 x IDE disk drive connector
- 1 x Infrared interface connector
- 1 x Keyboard connector
- 1 x Parallel port connector
- 1 x SDVO connector
- 4 x Serial ATA (SATA) drive connectors
- 2 x Serial port connectors
- 2 x USB connectors

The PCIE-9450 has the following external peripheral interface connectors on the board rear panel:

- 1 x PS/2 keyboard/mouse connector
- 2 x Ethernet connectors
- 1 x USB 2.0 connector
- 1 x VGA connector

The PCIE-9450 has the following on-board jumper:

- Clear CMOS

1.2.3 Technical Specifications

PCIE-9450 technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in Chapter 2.

Specification	PCIE-9450
Form Factor	PICMG1.3 full-size CPU card
System CPU	Socket LGA 775 Intel® Core™ 2 Duo (up to 2.66GHz) Socket LGA 775 Intel® Pentium® 4 (up to 3.8GHz) Socket LGA 775 Intel® Pentium® D (up to 3.6GHz) Socket LGA 775 Intel® Celeron® D (up to 3.6GHz) (Hyperthreading Technology supported)
Front Side Bus	533MHz, 800MHz or 1066MHz
System Chipset	Northbridge: Intel® 945G Express Southbridge: Intel® ICH7R
Memory	Four 240-pin DDR2 DIMM slots support four 1GB, 400MHz, 533MHz or 667MHz DDR2 SDRAM DIMMs
Display	CRT: Intel® Graphics Media Accelerator (GMA) 950 integrated with DB-15 VGA connector
BIOS	AMI BIOS
Audio	7.1 channel or 5.1 channel audio via optional AC-KIT
LAN	Broadcom PCI Express Gigabit Ethernet controller
COM	Two on-board RS-232 serial ports
USB 2.0	Seven USB 2.0 devices supported
IDE	One 40-pin IDE connects up to two Ultra ATA33/66/100 devices
Floppy Disk	One FDD connector supports one floppy disk drive
SATA	Four 3.0Gb/s SATA drives supported
Keyboard/mouse	One PS/2 connector supports mouse and keyboard connectivity
Watchdog Timer	Software programmable 1-255 sec. by supper I/O

Specification	PCIE-9450
Power Supply	+12V@9A, +5V@2.6A, 3.3V@6.3A, 5VSB@0.93A, -12V@0.1A (Pentium D 3.73GHz, 1066MHz CPU with 4GB DDR2-667MHz)
Temperature	0ºC ~ 60ºC (32ºF ~140ºF)
Humidity (operating)	5%~95% non-condensing
Dimensions	338mm x 122mm
Weight (GW)	1.2kg

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 Overview

This chapter describes the specifications and on-board features of the PCIE-9450 in detail.

2.2 Dimensions

2.2.1 Board Dimensions

The dimensions of the board are listed below and shown in **Figure 2-1**.

- **Length**: 338.58mm
- **Width**: 126.39mm

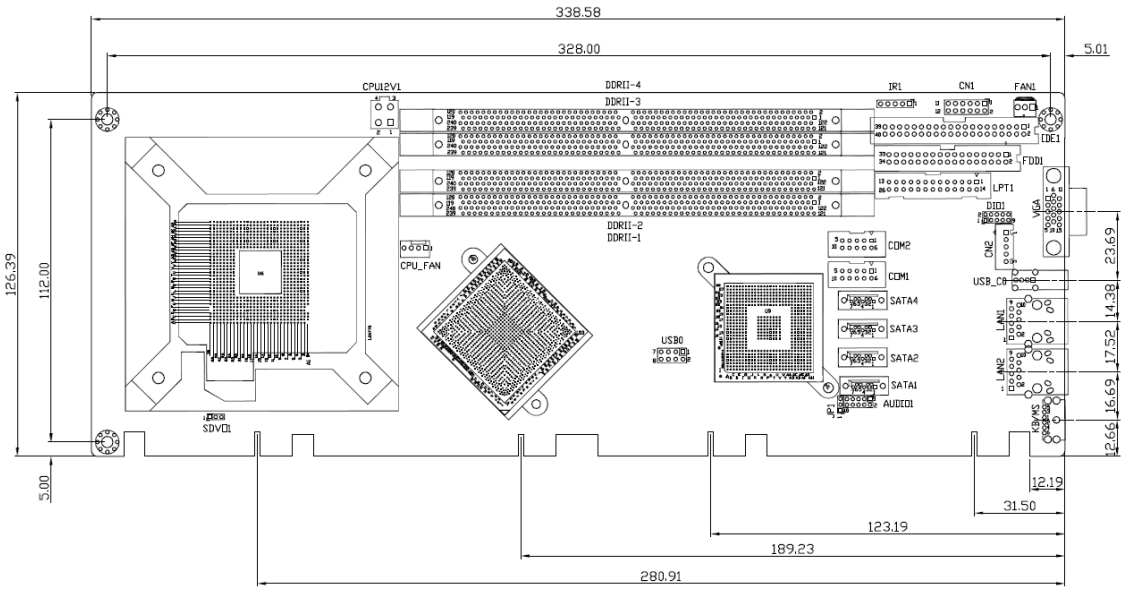

Figure 2-1: PCIE-9450 Dimensions (mm)

2.2.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.

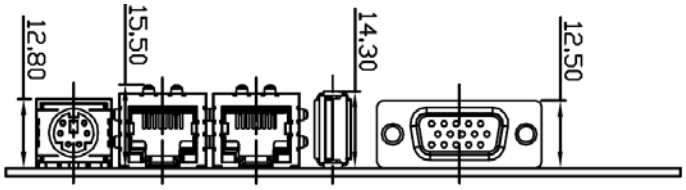

Figure 2-2: External Interface Panel Dimensions (mm)

2.3 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

Figure 2-3: Data Flow Block Diagram

2.4 Compatible Processors

2.4.1 CPU Overview

Socket LGA 775 Intel® Core™ 2 Duo, Intel® Pentium® 4, Intel® Pentium® D and Intel® Celeron® D processors can be installed on the PCIE-9450 CPU card. The Intel® Pentium® 4 processors and the Intel® Celeron® D processors all have Intel® Extended Memory 64 Technology (Intel® EMT64T)

2.4.2 Supported Intel® Core™ 2 Duo Processors

Specifications for the compatible Intel® Core™ 2 Duo processors are listed in **Table 2-1**.

CPU Speed	Bus Speed	Mfg. Tech	Cache	Package	Processor No.
2.66 GHz	1066 MHz	65 nm	4 MB	LGA 775	E6700
2.40 GHz	1066 MHz	65 nm	4 MB	LGA 775	E6600
2.13 GHz	1066 MHz	65 nm	2 MB	LGA 775	E6400
1.86 GHz	1066 MHz	65 nm	2 MB	LGA 775	E6300
1.80 GHz	800 MHz	65 nm	2 MB	LGA 775	E4300

Table 2-1: Supported Intel® Core™ 2 Duo Processors

2.4.3 Supported Intel® Pentium® 4 Processors

Specifications for the compatible Intel® Pentium® 4 processors are listed in **Table 2-2**.

CPU Speed	Bus Speed	Mfg. Tech	Cache	Package	Processor No.
3.80 GHz	800 MHz	90 nm	2 MB	LGA 775	672
3.80 GHz	800 MHz	90 nm	1 MB	LGA 775	570J
3.80 GHz	800 MHz	90 nm	1 MB	LGA 775	571

Table 2-2: Supported Intel® Pentium® 4 Processors

2.4.4 Supported Intel® Pentium® D Processors

Specifications for the compatible Intel® Pentium® D processors are listed in **Table 2-3**.

CPU Speed	Bus Speed	Mfg. Tech	Cache	Package	Processor No.
3.60 GHz	800 MHz	65 nm	4 MB	LGA 775	960
3.40 GHz	800 MHz	65 nm	4 MB	LGA 775	950
3.40 GHz	800 MHz	65 nm	4 MB	LGA 775	945

Table 2-3: Supported Intel® Pentium® D Processors

2.4.5 Supported Intel® Celeron® D Processors

Specifications for the compatible Intel® Celeron® D processors are listed in **Table 2-4** below:

CPU Speed	Bus Speed	Mfg. Tech	Cache	Package	Processor No.
3.60 GHz	533 MHz	65 nm	512 KB	LGA 775	365
3.46 GHz	533 MHz	65 nm	512 KB	LGA 775	360
3.33 GHz	533 MHz	65 nm	512 KB	LGA 775	356

Table 2-4: Supported Intel® Celeron® D Processors

2.5 Intel® 945G Northbridge Chipset

2.5.1 Intel® 945G Overview

The Intel® 945G northbridge chipset consists of a graphics and memory controller hub (GMCH). The GMCH on the Intel® 945G is interfaced to the Intel® I/O Controller Hub 7 (ICH7R) through a high speed Direct Media Interface (DMI) chip-to-chip connection. The high-speed DMI integrates priority based servicing that allows for concurrent traffic and true isochronous transfer capabilities. Some of the features of the Intel® 945G are listed below.

- Support 533/800/1066MHz FSB
- Supports four, 1GB, 400/533/667MHz dual channel DDR SDRAM DIMMs

- Integrated VGA and SDVO (Serial Digital Video Output) outputs
- Integrated Intel® Graphics Media Accelerator 950 (Intel® GMA 950)
- 2.0GB/s concurrent DMI bandwidth maximizes chipset communications
- PCI Express x16 Graphics Interface with a raw bit rate on data pins of 2Gb/s
- Integrated Intel® High Definition Audio
- Integrated Intel® Matrix Storage Technology
- Integrated Intel® Active Management Technology
- Integrated Intel® Flex Memory Technology

2.5.2 Intel® 945G Memory Support

The Intel® 945G supports four, 1GB, 400/533/667MHz dual channel DDR SDRAM DIMMs. Four 240-pin memory sockets on the PCIE-9450 enable a maximum of 4GB of memory to be installed on the system. The memory sockets are shown in **Figure 2-4**.

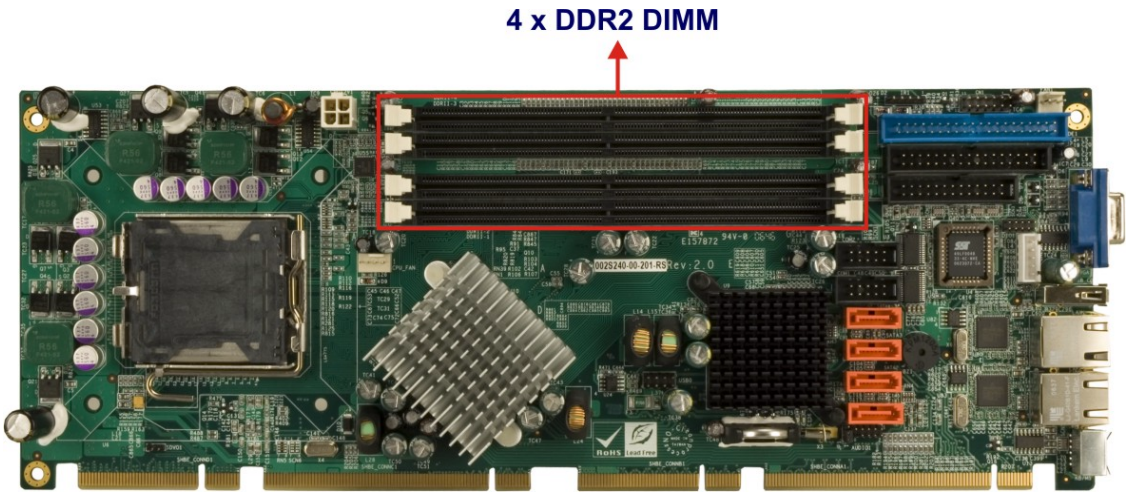

Figure 2-4: 240-pin DIMM Sockets

2.5.3 Intel® 945G Serial Digital Video Output (SDVO)

Some of the features of the SDVO ports are listed below.

- Two SDVO ports multiplexed with PCI Express graphics interface
- 200 MHz dot clock on each 12-bit interface
- Can combine two channels to form one larger interface

- Flat panels up to 2048x1536 @ 60 Hz or digital CRT/HDTV at 1920x1080 @ 85Hz
- Dual independent display options with digital display
- Multiplexed digital display channels (Supported with ADD2 Card).
- ADD2/ADD2+ card uses PCI Express graphics x16 connector

2.5.4 Intel® 945G Integrated Graphics Media Accelerator 950

The Intel® 945G has the Intel® GMA 950 integrated into the chipset. Some of the features of the GMA 950 are listed below.

- Intel GMA 950 Graphics Core
  - 400MHz 256-bit graphics core
  - Up to 10.6 GB/sec memory bandwidth with DDR2 667 MHz system memory
  - 1.6 GPixels/sec and 1.6 GTexels/sec fill rate
  - 192 MB maximum video memory
  - 2048x1536 at 75 Hz maximum resolution
  - Dynamic Display Modes for flat-panel, wide-screen and Digital TV support
  - Operating systems supported: Microsoft Windows* XP, Windows* XP 64-bit, Media Center Edition, Windows 2000; Linux-compatible (Xfree86 source available)
- High Performance 3D
  - Up to 4 pixels per clock rendering
  - Microsoft* DirectX* 9 Hardware Acceleration Features: Pixel Shader 2, Volumetric Textures, Shadow Maps, Slope Scale Depth Bias, Two-Sided Stencil
  - Microsoft* DirectX* 9 Vertex Shader 3.0 and Transform and Lighting supported in SW through highly optimized Processor Specific Geometry Pipeline (PSGP)
  - Texture Decompression for DirectX* and OpenGL*
  - OpenGL* 1.4 support with ARB extensions
- Advanced Display Technology
  - Consumer Electronic display (Digital TV) support

- Two Serial Digital Video Out (SDVO) ports for flat-panel monitors via ADD2 cards
- Multiple display types (LVDS, DVI-I, DVI-D, CRT)
- Dual screen support via ADD2 digital video devices
- HDTV 720p and 1080i display resolution support
- Interlaced Display output support

- High Quality Media Support
  - High Definition Hardware Motion Compensation to support HD hi-bitrate MPEG2 media playback
  - Up and Down Scaling of Video Content
  - HD Content Decode – up to two stream support
  - 5x3 Overlay Filtering

2.6 Intel® ICH7R Southbridge Chipset

2.6.1 Intel® ICH7R Overview

The ICH7R southbridge chipset on the PCIE-9450 has the features are listed below.

- Complies with PCI Express Base Specification, Revision 1.0a
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
  - Enhanced DMA controller
  - Interrupt controller
  - Timer functions
- Integrated SATA host controller with DMA operations on four ports with data transfer rates up to 3.0 Gb/s
- Integrated IDE controller supports Ultra ATA 100/66/33
- Supports eight USB 2.0 devices with four UHCI controllers and one EHCI controller
- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Audio Codec ’97 (AC’97) Revision 2.3
- Supports Intel® High Definition Audio
- Contains Low Pin Count (LPC) interface

- Supports Firmware Hub (FWH) interface
- Serial Peripheral Interface (SPI) for Serial and Shared Flash
- 1.05 V Core Voltage
- Intel® High Definition Audio Interface
- Intel® Active Management Technology
- Intel® Quick Resume Technology Support

2.6.2 Intel® ICH7R Audio Codec ’97 Controller

The Audio Codec ’97 (AC’97) controller integrated into the ICH7R complies with AC’97 Component Specification, Version 2.3. The AC’97 controller is connected to the onboard audio connector. The audio connector is connected to an optional 5.1 channel or 7.1 channel audio kit with an embedded AC’97 audio codec. The AC’97 controller supports up to six PCM audio output channels. Complete surround sound requires six-channel audio consisting of:

- Front left
- Front right
- Back left
- Back right
- Center
- Subwoofer

2.6.3 Intel® ICH7R IDE Interface

The integrated IDE interface on the ICH7R southbridge supports two IDE hard disks and ATAPI devices, PIO IDE transfers up to 16MB/s and Ultra ATA transfers of 100MB/s. The integrated IDE interface is able to support the following IDE HDDs:

- **Ultra ATA/100**, with data transfer rates up to 100MB/s
- **Ultra ATA/66**, with data transfer rates up to 66MB/s
- **Ultra ATA/33**, with data transfer rates up to 33MB/s

Table 2-5 shows the supported HDD specifications.

Specification	Ultra ATA/100	Ultra ATA/66	Ultra ATA/33
IDE devices	2	2	2
PIO Mode	0 – 4	0 – 4	0 – 4
PIO Max Transfer Rate	16.6 MB/s	16.6 MB/s	16.6 MB/s
DMA/UDMA designation	UDMA 3 - 4	UDMA 3 – 4	UDMA 2
DMA/UDMA Max Transfer	100MB/s	66MB/s	33MB/s
Controller Interface	5V	5V	5V

Table 2-5: Supported HDD Specifications

2.6.4 Intel® ICH7R Low Pin Count (LPC) Interface

The ICH7R LPC interface complies with the LPC 1.1 specifications. The LPC bus from the ICH7R is connected to the following components:

- BIOS chipset
- Super I/O chipset

2.6.5 Intel® ICH7R PCI Interface

The PCI interface on the ICH7R is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33MHz
- 5V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to seven PCI bus masters

Three of the seven PCI bus masters are interfaces to the following onboard components:

- PCI slot connector on the bottom of the CPU card
- Broadcom PCI Express GbE interface
- Winbond PCI-to-ISA bridge interface

The remaining four PCI bus masters are reserved for four PCI expansion boards that can be installed on the backplane.

2.6.6 Intel® ICH7R Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818A real time clock (RTC) integrated into the ICH7R. The RTC operates on a 3V battery and 32.768KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

2.6.7 Intel® ICH7R SATA Controller

The integrated SATA controller on the ICH7R southbridge supports four SATA drives with independent DMA operations. SATA controller specifications are listed below.

- Supports four SATA drives
- Supports 3.0Gb/s data transfer speeds
- Supports Serial ATA Specification, Revision 1.0a and supports several optional sections of the Serial ATA II: Extensions to Serial ATA 1.0 Specification, Revision 1.0 (AHCI support is required for some elements).

2.6.8 Intel® ICH7R USB Controller

Up to eight high-speed, full-speed or low-speed USB devices are supported by the ICH7R. High-speed USB 2.0, with data transfers of up to 480MB/s, is enabled with the ICH7R integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the four ICH7R integrated Universal Host Controller Interface (UHCI) controller.

2.7 PCI Bus Components

2.7.1 PCI Bus Overview

The PCI bus controller on the ICH7R southbridge is compliant with PCI Revision 2.3 specifications and has a 33MHz PCI clock. The components listed below are all connected to the PCI bus:

- PCI Express slot connector on the bottom of the CPU card
- Broadcom PCI Express GbE interface
- Winbond PCI-to-ISA bridge interface

2.7.2 PCI Express (PCIe) Slot Connector

The PCIe slot connector (**Figure 2-5**) is located on the bottom of the CPU card and slots into a PCIe slot on a backplane.

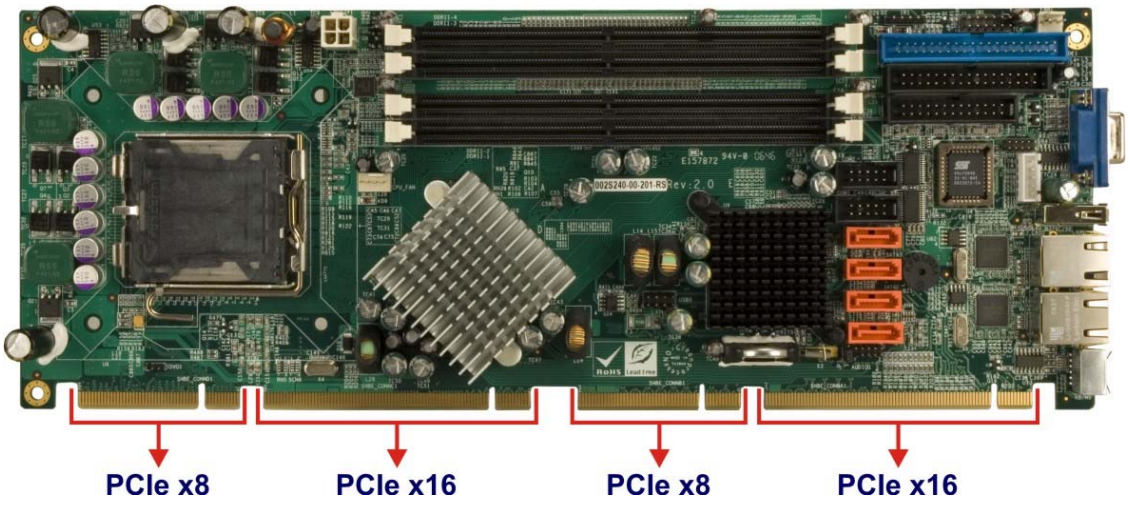

Figure 2-5: PCIe Slot Connector

PCIe expansion cards installed on the backplane communicate with the system through the PCIe connector.

2.7.3 Broadcom PCIe GbE interface

The BCM5787M Broadcom PCIe GbE controller is a 10/100/1000BASE-T Ethernet LAN controller. The BCM5787M combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, a PCIe bus interface, and an on-chip buffer memory. Some of the BCM5787 controller features are listed below:

- Integrated 10/100/1000BASE-T transceiver
- Automatic MDI crossover function
- PCIe v1.0a
- 10/100/1000BASE-T full/half-duplex MAC
- Wake on LAN support meeting the ACPI requirements
- Statistics for SNMP MIB II, Ethernet-like MIB, and Ethernet MIB (802.3z, clause 30)

- Serial EEPROM or serial flash support
- JTAG support

2.8 LPC Bus Components

2.8.1 LPC Bus Overview

The LPC bus is connected to components listed below and show in **Figure 2-6**.

- BIOS chipset
- Super I/O chipset (on reverse side of card)

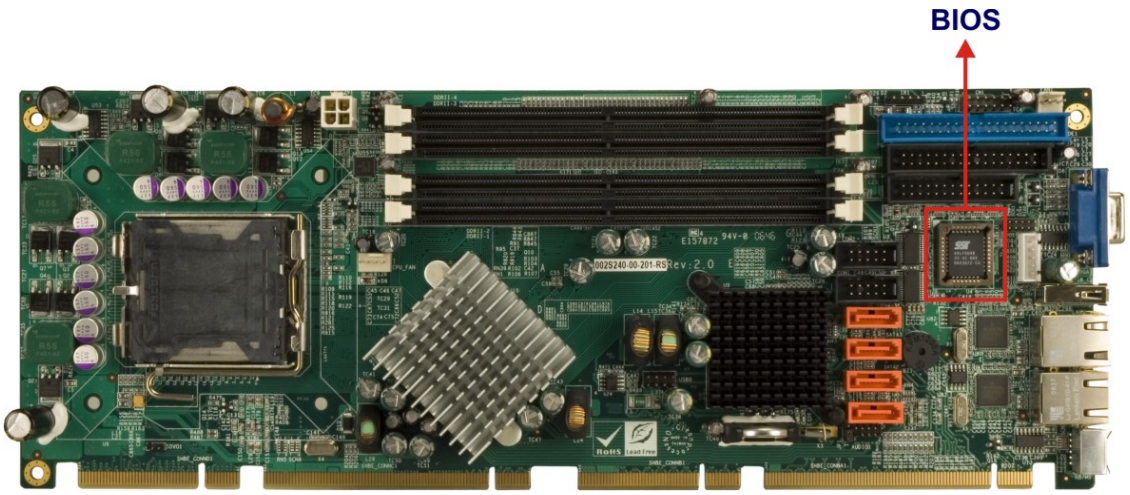

Figure 2-6: LPC Bus Chipsets

2.8.2 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

2.8.3 Super I/O Chipset

The Winbond W83627THG Super I/O chipset is connected to the ICH7R southbridge through the LPC bus. Some of the features of the Winbond W83627THG chipset are listed below.

- LPC Interface
- PC98/2001, ACPI and LANDesk Compliant
- Hardware Monitor
- Fan Speed Controller
- +5V, 5VSB and 3.3V Power Supply
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Floppy Disk Controller
- Keyboard Controller
- Watchdog Timer
- Serial IRQ Support

Some of the Super I/O features are described in more detail below.

2.8.3.1 Super I/O LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.1. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.8.3.2 Super I/O 16C550 UARTs

The onboard Super I/O has two integrated 16C550 UARTs that can support the following:

- Two standard serial ports
- IrDa 1.0 and ASKIR protocols

2.8.3.3 Super I/O Hardware Monitor

The Super I/O Hardware Monitor monitors three thermal inputs, VBAT internally, and eight voltage monitor inputs. The Super I/O Hardware Monitor supports the SmartFan® control

system, including the “Thermal Cruise™” and “Speed Cruise™” functions. These hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu.

2.8.3.4 Super I/O Fan Speed Controller

The Super I/O fan speed controller enables the system to monitor the speed of the fan. One of the pins on the fan connector is reserved for fan speed detection and interfaced to the fan speed controller on the Super I/O. The fan speed is then reported in the BIOS.

2.8.3.5 Super I/O Floppy Disk Controller

The Super I/O floppy disk controller (FDC) supports the following 3-mode floppy disk drives (FDD).

- 360KB
- 720KB
- 1.2MB
- 1.44MB
- 2.88MB

The FDC also supports automatic write protection through software.

2.8.3.6 Super I/O Parallel Port

The Super I/O parallel port (LPT) supports standard mode, enhanced mode and high-speed mode parallel port devices. The LPT is compliant with the following LPT modes.

- Standard mode
  - Bi-directional SPP compliant
- Enhanced mode
  - EPP v1.7 compliant
  - EPP v1.9 compliant
- High-speed mode
  - ECP, IEEE 1284 compliant

2.8.3.7 Super I/O Keyboard Controller

The Super I/O keyboard controller can execute the 8042 instruction set. Some of the keyboard controller features are listed below:

- The 8042 instruction is compatible with a PS/2 keyboard and PS/2 mouse
- Gate A20 and Keyboard reset output
- Supports multiple keyboard power on events
- Supports mouse double-click and/or mouse move power on events

2.9 Environmental and Power Specifications

2.9.1 System Monitoring

Three thermal inputs on the PCIE-9450 Super I/O Hardware Monitor the following temperatures:

- System temperature
- Power temperature
- CPU temperature

The PCIE-9450 Super I/O Hardware Monitor the following voltages:

- 4 external voltage detect inputs
- 3 intrinsic voltage monitoring (typical for Vbat, +5VSB , +5VCC)

The PCIE-9450 Super I/O Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed
- System Fan speed
- Auxiliary Fan speed

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

2.9.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the PCIE-9450 are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the northbridge and southbridge chipsets to ensure the operating temperature of these chips remain low.

2.9.3 Power Consumption

Table 2-6 shows the power consumption parameters for the PCIE-9450 when running with a 3.73GHz, Intel® Pentium D processor with a 1066MHz FSB and 4GB of 667MHz DDR2 memory.

Voltage	Current
+3.3V	6.3A
+5V	2.6A
5VSB	0.93A
-12V	0.1A
+12V	9A

Table 2-6: Power Consumption

Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the PCIE-9450 may result in permanent damage to the PCIE-9450 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PCIE-9450. Dry climates are especially susceptible to ESD. It is critical that the following anti-static precautions are strictly adhered to whenever handling the PCIE-9450 or any other electrical component.

- ***Wear an anti-static wristband*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the PCIE-9450.
- ***Self-grounding*** - Touch a grounded conducting material before handling and periodically while handling the PCIE-9450.
- ***Use an anti-static pad*** - When configuring the PCIE-9450, place it on an antic-static pad to reduce the possibility of ESD damage.
- ***Only handle the edges of the PCIE-9450*** - When handling the PCIE-9450, hold it by its edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the PCIE-9450 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the PCIE-9450 does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

3.3 Unpacking Checklist

NOTE:

If any components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the PCIE-9450 was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

3.3.1 Package Contents

The PCIE-9450 is shipped with the following components:

Quantity	Item and Part Number	Image
1	PCIE-9450	
1	ATA 66/100 flat cable (P/N: 32200-000052-RS)	
1	KB/MS PS/2 Y-cable (P/N: 32000-000138-RS)	

Quantity	Item and Part Number	Image
1	Double RS-232 cable (P/N: 19800-000051-RS)	
4	SATA cables (P/N: 32000-062800-RS)	
2	SATA power cable (P/N: 32100-088600-RS)	
1	USB cable (P/N: CB-USB02-RS)	
1	Mini jumper Pack (P/N: 33100-000079-RS)	
1	Quick Installation Guide (P/N: 51000-001083-RS)	
1	Utility CD (P/N: IEI-7B000-000087/CD1)	

Table 3-1: Package List Contents

3.3.2 Optional Components

The following components are optional:

Item and Part Number	Image
5.1 Channel Audio Kit (P/N: AC-KIT08R-R10)	
7.1 Channel Audio Kit (P/N: AC-KIT-883 HD)	
CPU cooling kit (P/N: CF-520-RS)	
CPU cooling kit (P/N: CF-775A-RS)	
FDD cable (P/N: 32200-0000-17-RS)	
LPT cable (P/N: 19800-000049-RS)	
VGA output SDVO card (P/N: SVDO-100VGA-R10)	
DVI output SDVO card (P/N: SVDO-100DVI-R10)	

Table 3-2: Optional Components

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Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 4.1.2 shows peripheral interface connector locations. **Section 4.1.2** lists all the peripheral interface connectors seen in **Section 4.1.2**.

4.1.1 PCIE-9450 Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

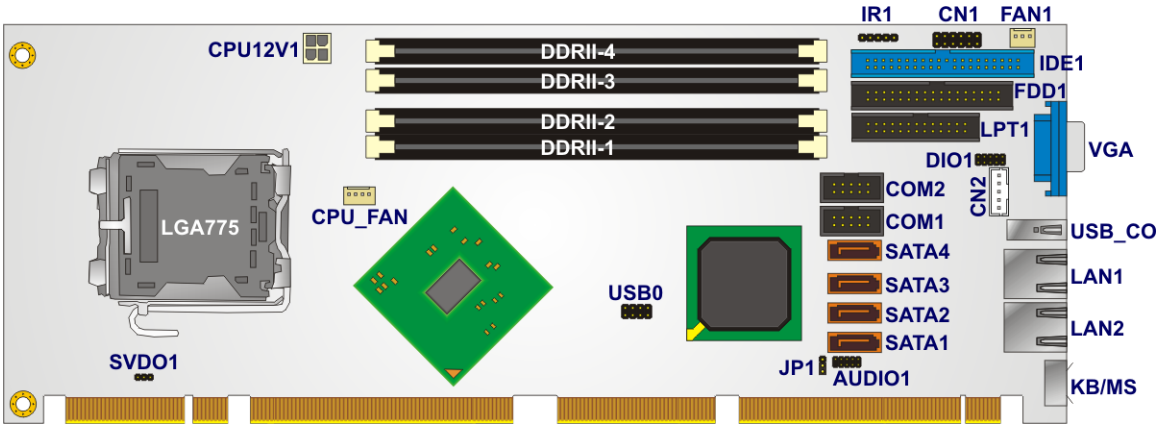


Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the PCIE-9450. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX power connector	4-pin header	CPU12V1
Audio connector	10-pin header	AUDIO1
Fan connector - CPU	3-pin wafer	CPU_FAN
Fan connector - System	4-pin wafer	FAN1
Floppy disk drive connector	34-pin box header	FDD1
Front panel connector	12-pin header	CN1
IDE Interface connector	40-pin box header	IDE1

Connector	Type	Label
Infrared connector	5-pin header	IR1
Keyboard connector	5-pin wafer	CN2
Parallel port connector	26-pin box header	LPT1
RS-232 serial port connector	10-pin box header	COM1
RS-232 serial port connector	10-pin box header	COM2
SATA drive connector	7-pin SATA	SATA1
SATA drive connector	7-pin SATA	SATA2
SATA drive connector	7-pin SATA	SATA3
SATA drive connector	7-pin SATA	SATA4
SDVO connector	3-pin header	SDVO1
USB connector	8-pin header	USB0

Table 4-1: Peripheral Interface Connectors

4.1.3 External Peripheral Interface Panel Connectors

Table 4-2 lists the external peripheral interface panel connectors on the PCIE-9450. Detailed descriptions of these connectors can be found in.

Connector	Type	Label
Keyboard/Mouse	PS/2	KB/MS
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2
USB port connector	USB port	USB_C0
VGA port connector	DB-15 (female)	VGA1

Table 4-2: External Peripheral Interface Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the PCIE-9450.

4.2.1 +12V ATX Power Supply Connector

CN Label: CPU12V1

CN Type: 4-pin ATX power connector (1x4)

CN Location: See **Figure 4-2**

CN Pinouts: See **Table 4-3**

The 4-pin +12V ATX power supply connector is connected to a +12V ATX power supply.

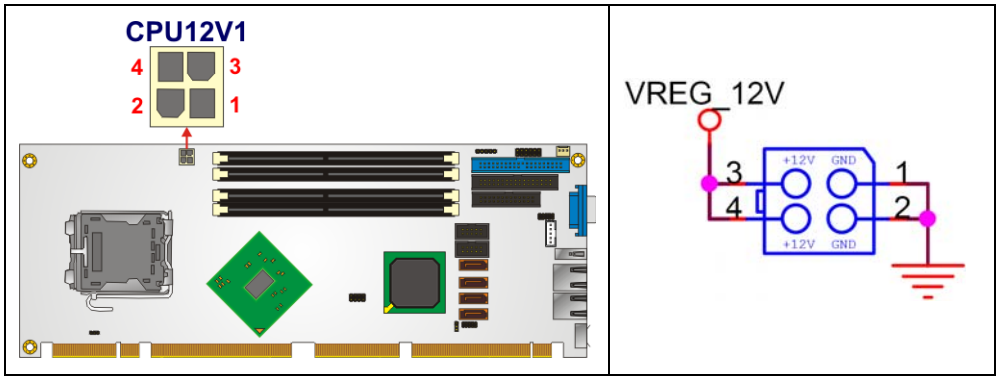


Figure 4-2: +12V ATX Power Connector Location

PIN	DESCRIPTION
1	GND
2	GND
3	+12V
4	+12V

Table 4-3: +12V ATX Power Connector Pinouts

4.2.2 Audio Connector (10-pin)

CN Label: AUDIO1

CN Type: 10-pin header (2x5)

CN Location: See **Figure 4-3**

CN Pinouts: See **Table 4-4**

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

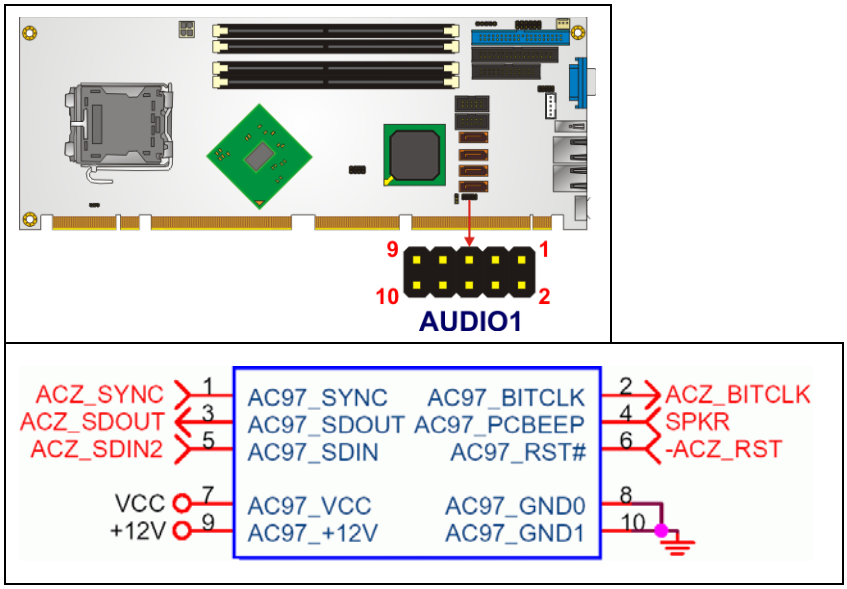


Figure 4-3: Audio Connector Location (10-pin)

PIN	DESCRIPTION	PIN	DESCRIPTION
1	AC_SYNC	2	AC_CLK
3	AC_SDOUT	4	PC_BEEP
5	AC_SDIN	6	AC_RST#
7	PWR (+5V)	8	GND
9	PWR (+12V)	10	GND

Table 4-4: Audio Connector Pinouts (10-pin)

4.2.3 Digital Input/Output (DIO) Connector

CN Label: DIO1

CN Type: 10-pin header (2x5)

CN Location: See **Figure 4-4**

CN Pinouts: See **Table 4-5**

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

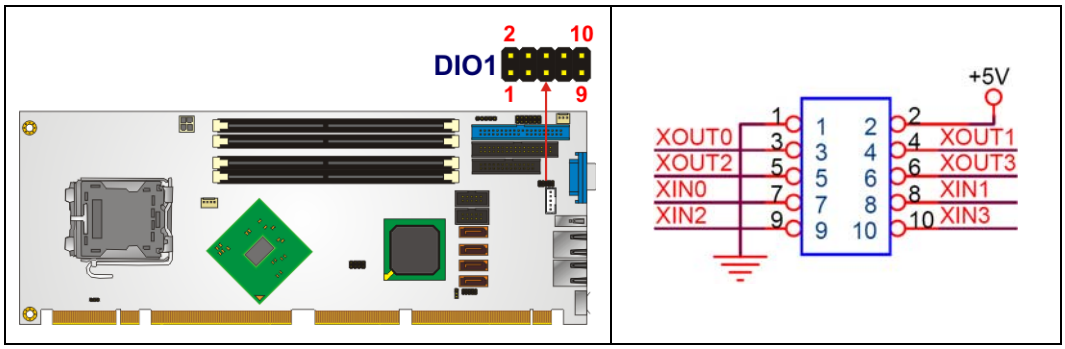


Figure 4-4: DIO Connector Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	PWR (+5V)
3	XOUT0	4	XOUT1
5	XOUT3	6	XOUT4
7	XIN0	8	XIN1
9	XIN2	10	XIN3

Table 4-5: DIO Connector Pinouts

4.2.4 Fan Connectors

CN Label:	CPU_FAN, FAN1
CN Type:	CPU_FAN: 4-pin wafer connector FAN1: 3-pin wafer connector
CN Location:	See **Figure 4-5**
CN Pinouts:	See **Table 4-6**

The CPU_FAN and FAN1 cooling fan connectors provide a 12V current to the cooling fans. The connector has a "rotation" pin to get rotation signals from the fan and notify the system so the system BIOS can recognize the fan speed. Please note that only certain fans can issue the rotation signals.

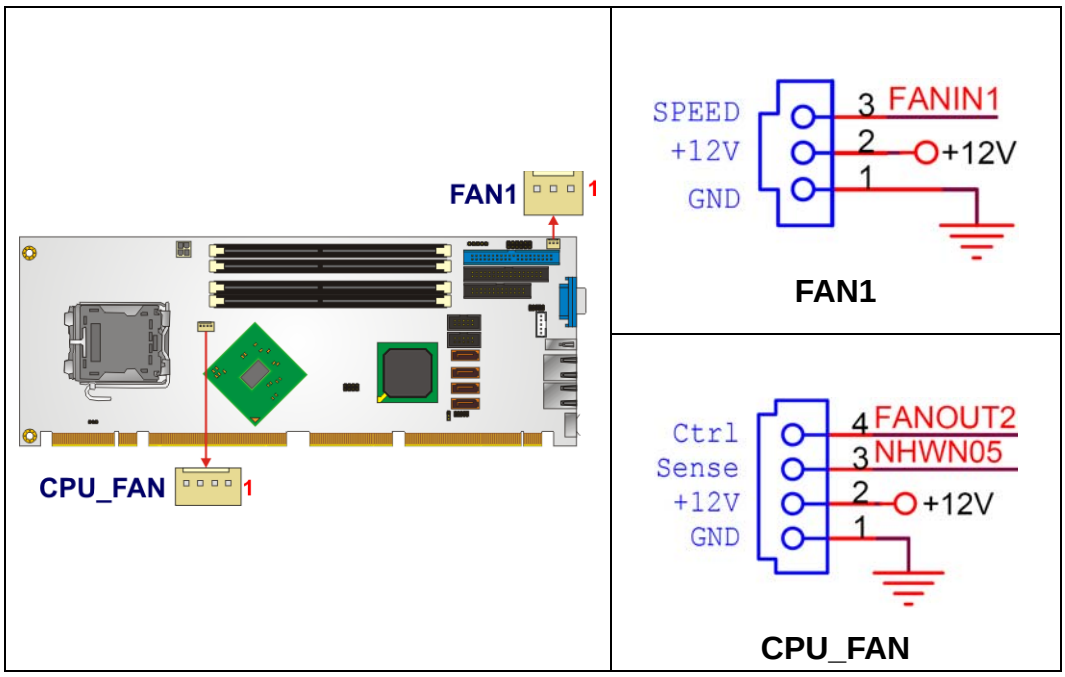


Figure 4-5: Fan Connectors Locations

PIN	CPU_FAN	FAN1
1	GND	GND
2	+12V	+12V
3	Rotation Signal	Rotation Signal
4	Control	

Table 4-6: Fan Connectors Pinouts

4.2.5 Floppy Disk Connector (34-pin)

CN Label: FDD1

CN Type: 34-pin header (2x17)

CN Location: See **Figure 4-6**

CN Pinouts: See **Table 4-7**

The floppy disk connector is connected to a floppy disk drive.

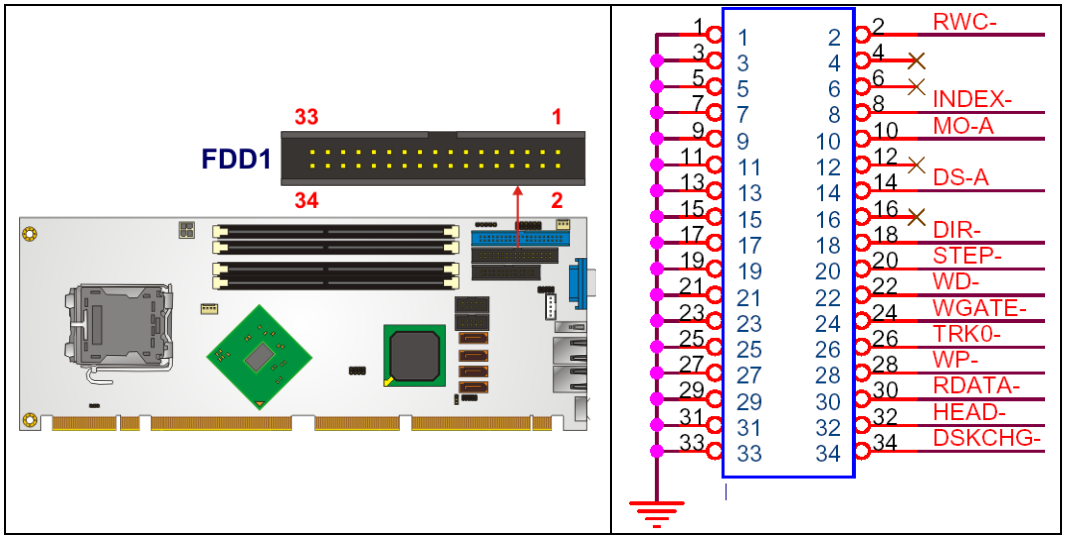


Figure 4-6: 34-pin FDD Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	REDUCE WRITE
3	GND	4	N/C
5	N/C	6	N/C
7	GND	8	INDEX#
9	GND	10	MOTOR ENABLE A#
11	GND	12	DRIVE SELECT B#
13	GND	14	DRIVE SELECT A#
15	GND	16	MOTOR ENABLE B#
17	GND	18	DIRECTION#
19	GND	20	STEP#
21	GND	22	WRITE DATA#
23	GND	24	WRITE GATE#
25	GND	26	TRACK 0#
27	GND	28	WRITE PROTECT#
29	GND	30	READ DATA#
31	GND	32	SIDE 1 SELECT#
33	GND	34	DISK CHANGE#

Table 4-7: 34-pin FDD Connector Pinouts

4.2.6 Front Panel Connector (12-pin)

CN Label: CN1

CN Type: 12-pin header (2x6)

CN Location: See **Figure 4-7**

CN Pinouts: See **Table 4-8**

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power button
- Reset button
- Power LED
- HDD LED
- PC speaker

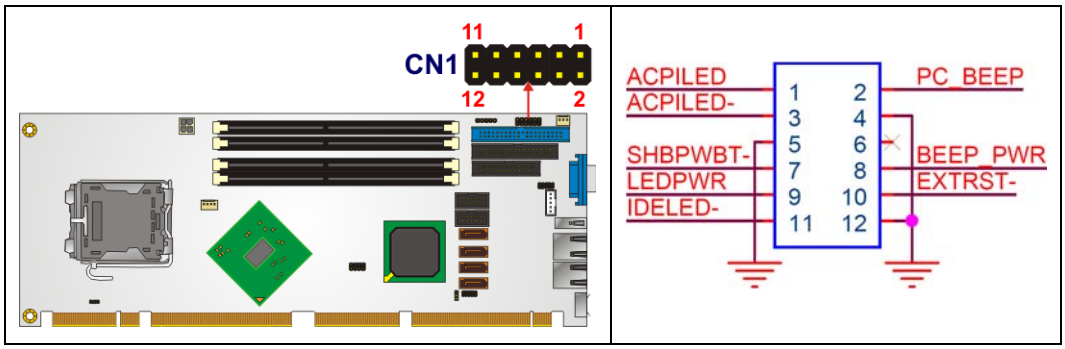


Figure 4-7: Front Panel Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	PWR LED+	2	PC_BEEP
3	PWR LED-	4	GND
5	PWR ON+	6	NC
7	PWR ON-	8	PWR (+5V)
9	HDD LED+	10	Reset+
11	HDD LED-	12	Reset-

Table 4-8: Front Panel Connector Pinouts

4.2.7 IDE Connector (40-pin)

CN Label: IDE1

CN Type: 40-pin header (2x20)

CN Location: See **Figure 4-8**

CN Pinouts: See **Table 4-9**

One 40-pin IDE device connector on the PCIE-9450 supports connectivity to two hard disk drives.

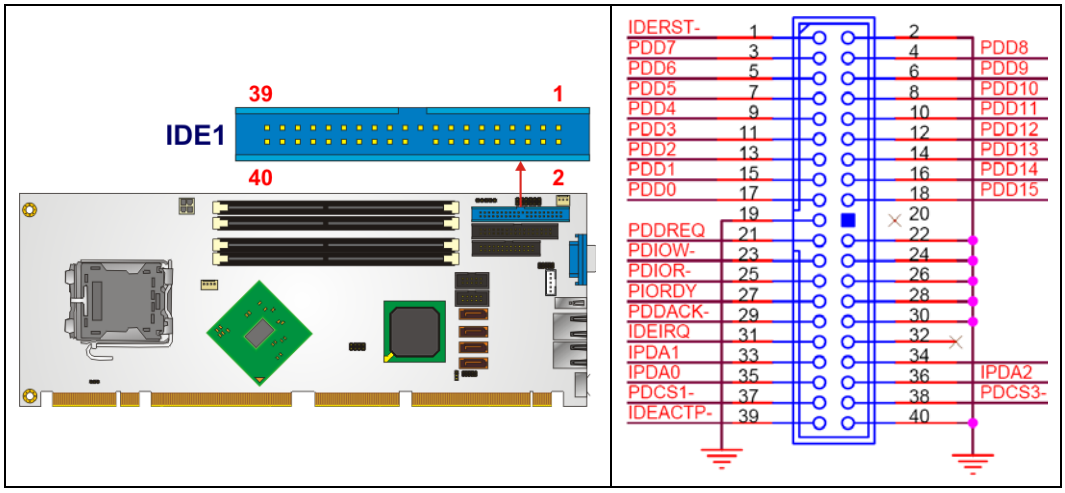


Figure 4-8: IDE Device Connector Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15

PIN	DESCRIPTION	PIN	DESCRIPTION
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

Table 4-9: IDE Connector Pinouts

4.2.8 Infrared Interface Connector (5-pin)

CN Label: IR1

CN Type: 5-pin header (1x5)

CN Location: See **Figure 4-9**

CN Pinouts: See **Table 4-10**

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

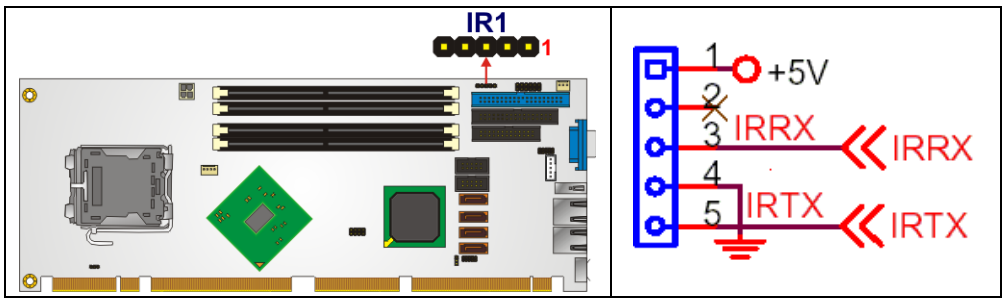


Figure 4-9: Infrared Connector Pinout Locations

PIN	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 4-10: Infrared Connector Pinouts

4.2.9 Keyboard Connector

CN Label:	**KB1**
CN Type:	5-pin header (1x5)
CN Location:	See **Figure 4-10**
CN Pinouts:	See **Table 4-11**

The keyboard connector can be connected to a standard PS/2 cable or PS/2 cable to add keyboard and mouse functionality to the system.

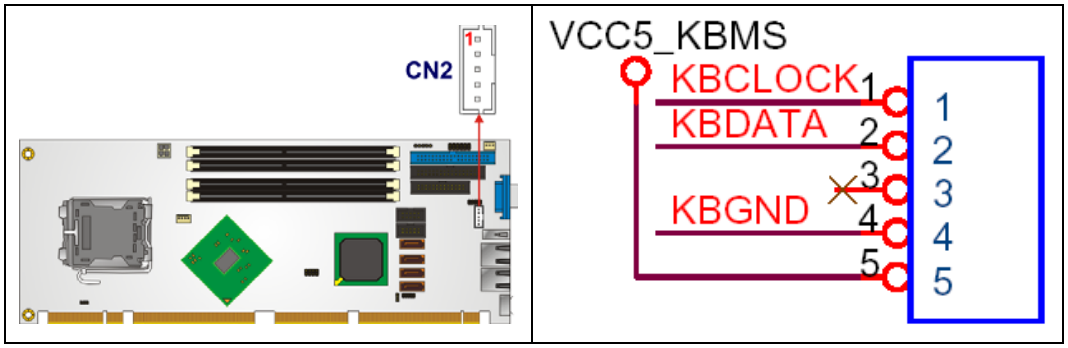


Figure 4-10: Keyboard Connector Location

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	VCC

Table 4-11: Keyboard Connector Pinouts

4.2.10 Parallel Port Connector

CN Label: LPT1

CN Type: 26-pin box header

CN Location: See **Figure 4-10**

CN Pinouts: See **Table 4-11**

The 26-pin parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.

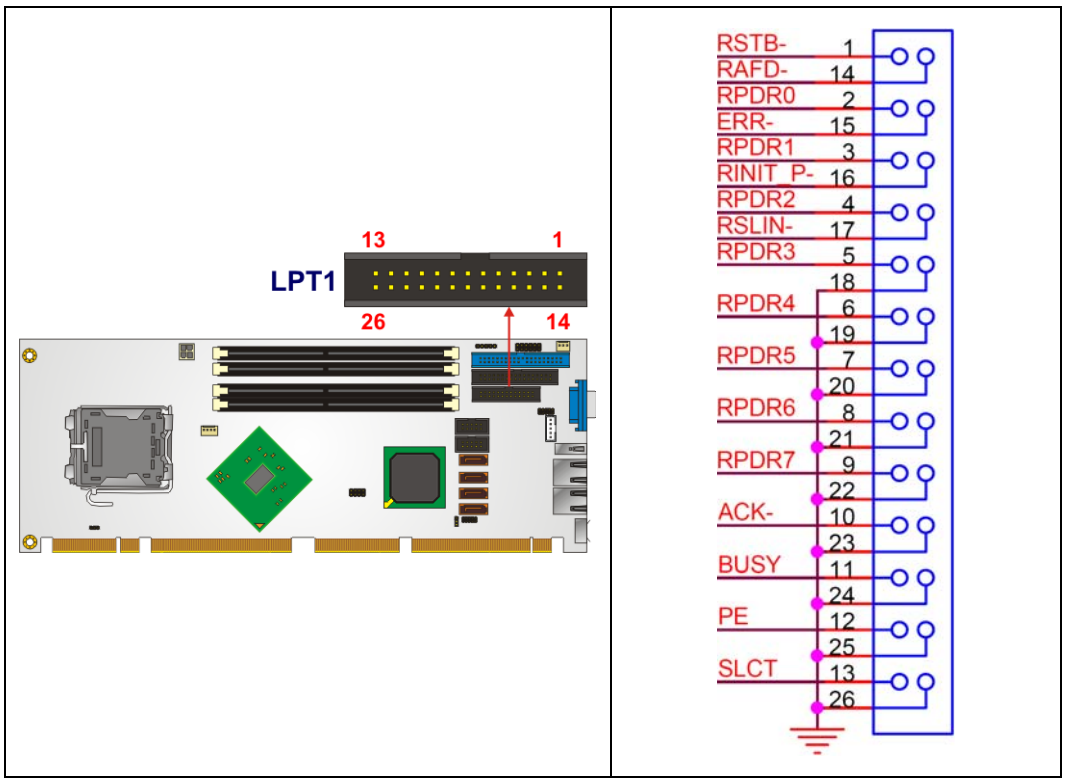


Figure 4-11: Parallel Port Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	NC

Table 4-12: Parallel Port Connector Pinouts

4.2.11 SATA Drive Connectors

CN Label: SATA1, SATA2, SATA3 and SATA4

CN Type: 7-pin SATA drive connectors

CN Location: See **Figure 4-11**

CN Pinouts: See **Table 4-12**

The SATA drive connectors are connected to SATA 3Gb/s disk drives that transfer data at speeds as high as 3.0Gb/s. The SATA drives can be configured in a RAID configuration.

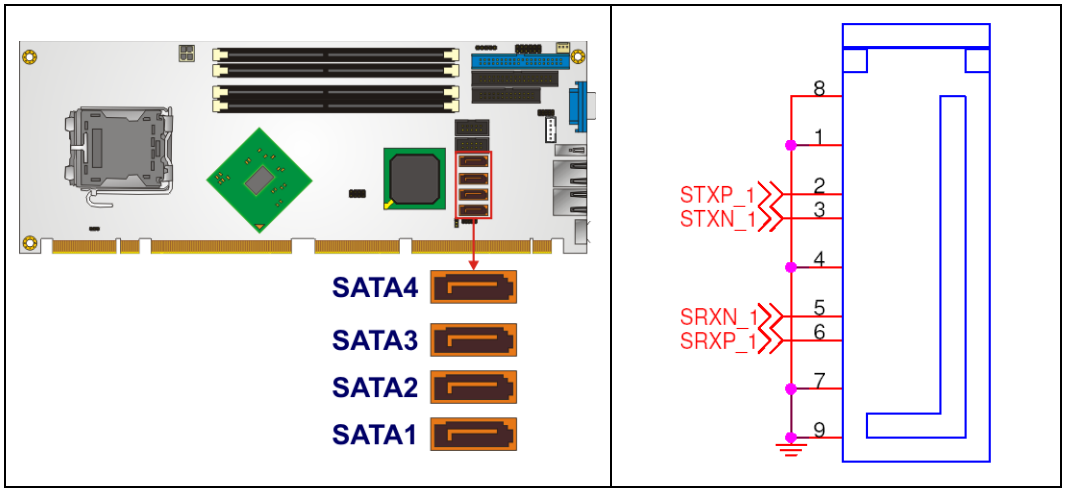


Figure 4-12: SATA Drive Connector Locations

PIN	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 4-13: SATA Drive Connector Pinouts

4.2.12 Serial Port Connector (COM1 and COM2)

CN Label: COM1 and COM2

CN Type: 10-pin header (2x5)

CN Location: See **Figure 4-12**

CN Pinouts: See **Table 4-13**

The 10-pin serial port connectors provide RS-232 serial communications channels that can be connected to external RS-232 serial port devices.

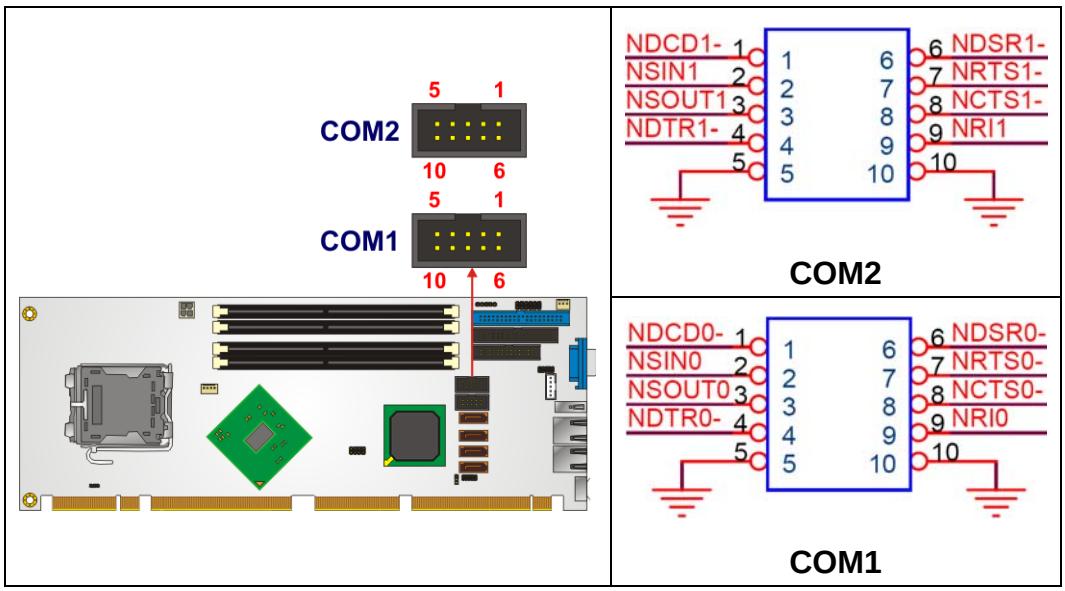


Figure 4-13: Serial Port Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD-	6	DSR-
2	SIN	7	RTS-
3	SOUT	8	CTS-
4	DTR-	9	RI
5	GND	10	GND

Table 4-14: Serial Port Connector Pinouts

4.2.13 USB Connectors (Internal)

CN Label: USB0

CN Type: 8-pin header (2x4)

CN Location: See **Figure 4-13**

CN Pinouts: See **Table 4-14**

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

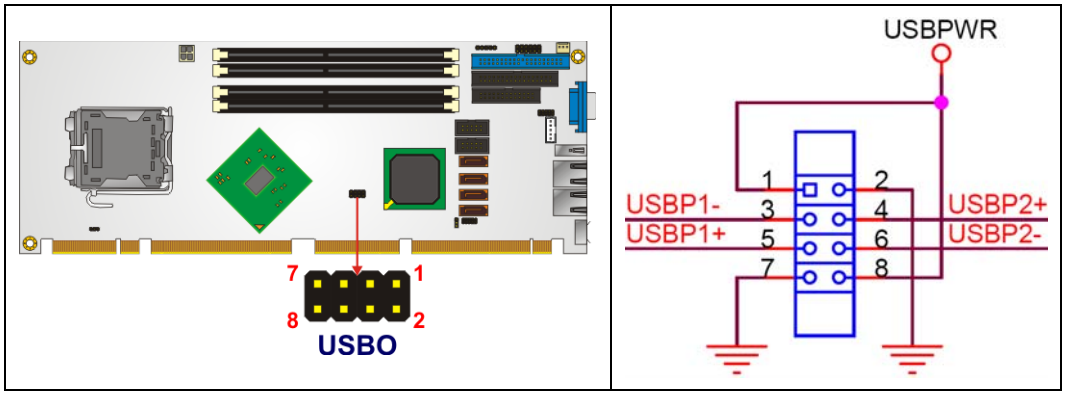


Figure 4-14: USB Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	PWR (+5V)	2	GND
3	USBPB-	4	USBPB+
5	USBPA+	6	USBPB-
7	GND	8	PWR (+5V)

Table 4-15: USB Port Connector Pinouts

4.3 External Peripheral Interface Connectors

Figure 4-15 shows the PCIE-9450 external peripheral connector panel. The peripheral connectors on the panel can be connected to devices externally when the motherboard is installed in a chassis. The external peripheral connectors are:

- 1 x Keyboard/Mouse connector (labeled 1)
- 2 x RJ-45 GbE connectors (labeled 2 and 3)
- 2 x USB 2.0 ports (labeled 4)
- 1 x VGA connector (labeled 5)

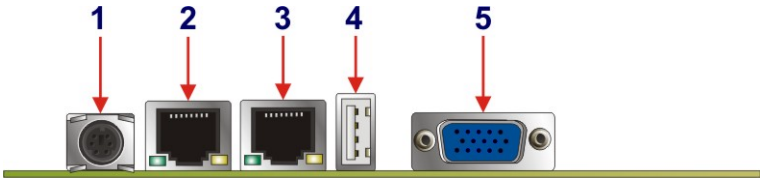


Figure 4-15: PCIE-9450 External Peripheral Connector Panel

4.3.1 Keyboard/Mouse Connector

CN Label:	KB/MS
CN Type:	PS/2
CN Location:	See **Figure 4-15** (labeled 1)
CN Pinouts:	See **Figure 4-16**, **Table 4-16** and **Table 4-17**

The PCIE-9450 keyboard and mouse connector is a standard PS/2 connector.

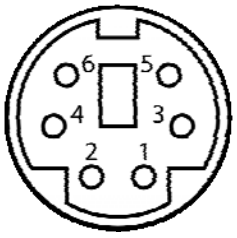


Figure 4-16: PS/2 Pinout and Configuration

PIN	DESCRIPTION
1	KB DATA
2	NC
3	GND
4	VCC
5	KB CLOCK
6	NC

Table 4-16: Keyboard Connector Pinouts

PIN	DESCRIPTION
1	MS DATA
2	NC
3	GND
4	VCC
5	MS CLOCK
6	NC

Table 4-17: Mouse Connector Pinouts

4.3.2 Ethernet Connector

CN Label: LAN1 and LAN2

CN Type: RJ-45 ports

CN Location: See **Figure 4-15** (labeled 2 and 3)

CN Pinouts: See **Table 4-18** and **Table 4-19**

A 1Gb connection can be made between the Ethernet connectors and a Local Area Network (LAN) through a network hub.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX+ (or MDX0+)	5	N/C (or MDX2-)
2	TX- (or MDX0-)	6	RX- (or MDX1-)
3	RX+ (or MDX1+)	7	N/C (or MDX3+)
4	N/C (or MDX2+)	8	N/C (or MDX3-)
13	MDX0+	17	MDX2-
14	MDX0-	18	MDX1-
15	MDX1+	19	MDX3+
16	MDX2+	20	MDX3-
1	TX+ (or MDX0+)	5	N/C (or MDX2-)
2	TX- (or MDX0-)	6	RX- (or MDX1-)

Table 4-18: Ethernet Connector Pinouts

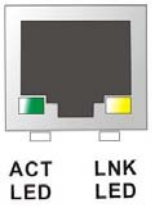


Figure 4-17: Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked (**Table 4-19**).

SPEED LED		LINK LED	
Status	**Description**	**Status**	**Description**
GREEN	ON: 100MB OFF: 10MB	YELLOW	ON: Linked Flashing: Activity

Table 4-19: Ethernet Connector LEDs

4.3.3 USB Connectors

CN Label: USB_C0

CN Type: USB port

CN Location: See **Figure 4-15** (labeled 4)

CN Pinouts: See **Table 4-20**

USB devices connect directly to the USB connector on the external peripheral connector panel.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	5	VCC
2	USBD0-	6	USBD0-
3	USBD0+	7	USBD0+
4	GND	8	GND

Table 4-20: USB Connector Pinouts

4.3.4 VGA Connector

CN Label: VGA

CN Type: HD-D-sub 15 Female connector

CN Location: See **Figure 4-15** (labeled 5)

CN Pinouts: See **Figure 4-18** and **Table 4-21**

The standard HD-D-sub 15 female connector connects to a CRT or LCD monitor.

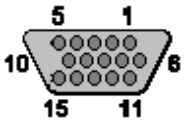


Figure 4-18: VGA Connector

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		

Table 4-21: VGA Connector Pinouts

4.4 On-board Jumpers

The PCIE-9450 has fifteen on-board jumpers. Refer to **Section 5.4** for jumper configuration settings.

Chapter

5

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the PCIE-9450 may result in permanent damage to the PCIE-9450 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PCIE-9450. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PCIE-9450, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the PCIE-9450, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the PCB***: When handling the PCB, hold it by its edges.

5.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the PCIE-9450 is installed. All installation notices pertaining to the installation of the PCIE-9450 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the PCIE-9450 and injury to the person installing the motherboard.

5.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the PCIE-9450 and injury to the user.

Before and during the installation please DO the following:

- **Read the user manual**:
  - The user manual provides a complete description of the PCIE-9450 installation instructions and configuration options.
- **Wear an electrostatic discharge cuff (ESD)**:
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- **Place the PCIE-9450 on an antistatic pad**:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn off all power to the PCIE-9450**:

- When working with the PCIE-9450, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the PCIE-9450 DO NOT:

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

5.2.2 Installation Checklist

The following checklist is provided to ensure the PCIE-9450 is properly installed.

- All the items in the packing list are present (see **Chapter 3**)
- A CPU is installed
- A CPU cooling kit is properly installed
- Compatible memory modules are properly inserted into the memory slots
- The PCIE-9450 is installed into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices (if applicable) are properly connected
  - IDE device
  - SATA drives
  - Floppy disk drive
  - System front panel connector
  - Audio kit
  - Power supply
  - USB cable
  - Serial port cable
  - Parallel port cable
  - Keyboard/mouse cable
  - COM port cables
- The following external peripheral devices are properly connected to the chassis:

- VGA screen
- Keyboard
- Mouse
- USB device
- LAN

5.3 CPU, CPU Cooling Kit and DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, PCIE-9450 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the PCIE-9450. If one of these component is not installed the PCIE-9450 cannot run.

5.3.1 Socket LGA775 CPU Installation

NOTE:

Enabling Hyper-Threading Technology on the system requires meeting all of the platform requirements listed below:

- **CPU**: An Intel® Pentium 4 Processor (or better) with HT Technology must be installed
- **Chipset**: An Intel® Chipset that supports HT Technology
- **OS**: An operating system that has optimizations for HT Technology

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

The LGA775 is shown in **Figure 5-1**.

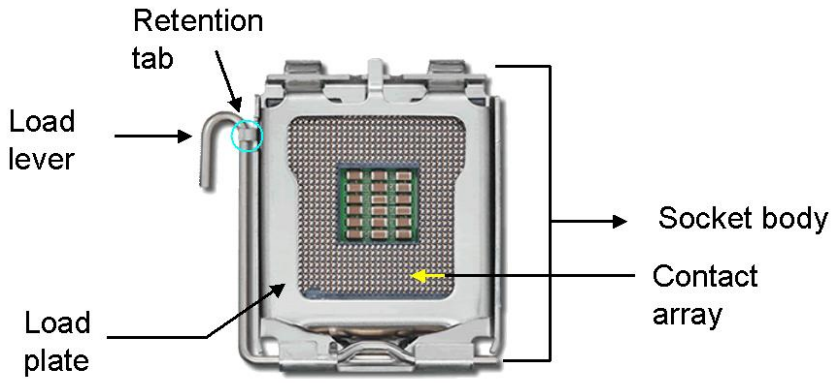


Figure 5-1: Intel LGA775

To install a LGA775 CPU onto the PCIE-9450, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Remove the protective cover.** Remove the black protective cover by prying it off the load plate. To remove the protective cover, locate the "**REMOVE**" sign and use your fingernail to pry the protective cover off. See **Figure 5-2**.

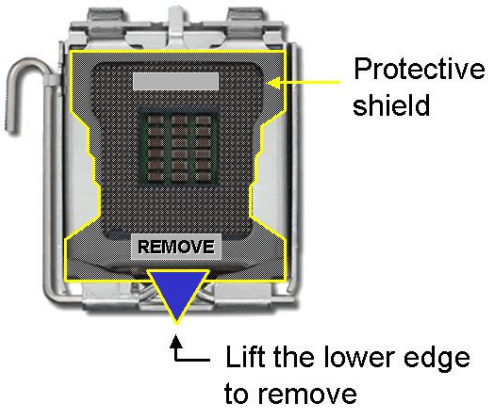


Figure 5-2: Remove the CPU Socket Protective Shield

Step 2: **Open the socket**. Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Rotate the load lever to a fully open position. Then rotate the load plate towards the opposite direction. See **Figure 5-3**.

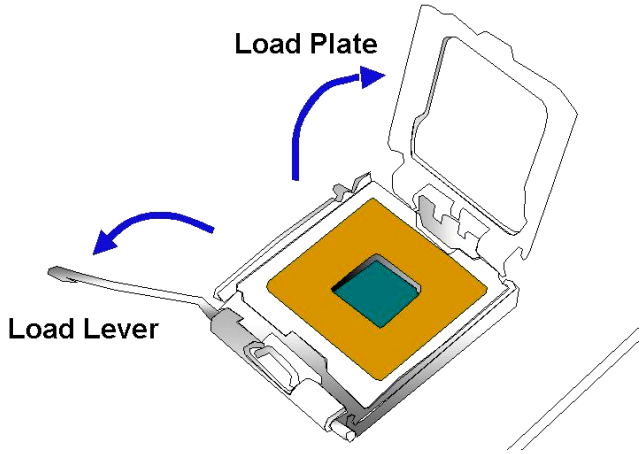


Figure 5-3: Open the CPU Socket Load Plate

Step 3: **Inspect the CPU socket** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 4: **Orientate the CPU properly**. Make sure the IHS (Integrated Heat Sink) side is facing upward.

Step 5: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

Step 6: **Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

Step 7: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 5-4**.

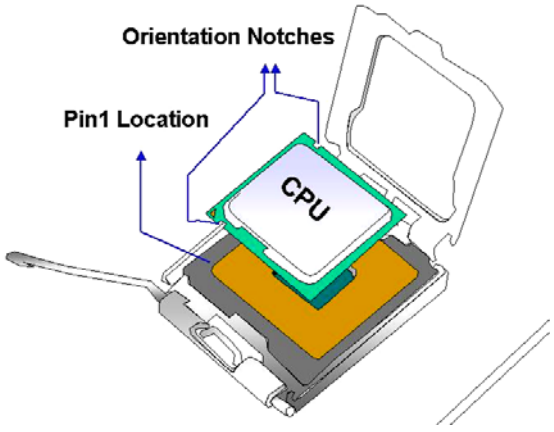


Figure 5-4: Insert the LGA775 CPU

Step 8: **Close the CPU socket.** Close the load plate and engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.

Step 9: **Connect the CPU 12V cable to the 12After the cooling kit is installed** connect the CPU cable to the CPU 12V power connector

5.3.2 LGA775 Cooling Kit Installation

WARNING:

It is strongly recommended that the original heat sink and cooler provided by Intel not be used on the PCIE-9450.

IEI's cooling kits include a support bracket that is combined with the heat sink mounted on the CPU to counterweigh and balance the load on both sides of the PCB.

CF-520-RS

CF-775A-RS

Figure 5-5: IEI Cooling Kits

The IEI LGA775 CPU cooling kits shown in **Figure 5-5** can be purchased separately. The cooling kits comprise of a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

Follow the instructions below to install a cooling kit.

Step 1: **Place the cooling kit onto the LGA775 CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

Step 2: **Properly align the cooling kit**. Make sure the four spring screw fasteners can pass through the pre-drilled holes on the PCB.

Step 3: **Mount the cooling kit**. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the predrilled holes on the bottom of the PCB.

Step 4: **Secure the cooling kit**. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See **Figure 5-6**)

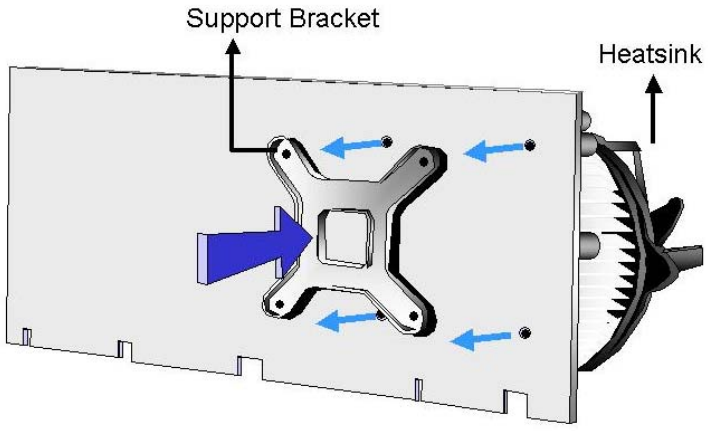


Figure 5-6: Securing the Heat sink to the PCB Board

Step 5: **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

Step 6: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the PCIE-9450. Carefully route the cable and avoid heat generating chips and fan blades.

5.3.3 DIMM Installation

WARNING:

Using incorrectly specified DIMM may cause permanently damage the PCIE-9450. Please make sure the purchased DIMM complies with the memory specifications of the PCIE-9450. DIMM specifications compliant with the PCIE-9450 are listed in **Chapter 2**.

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 5-7**.

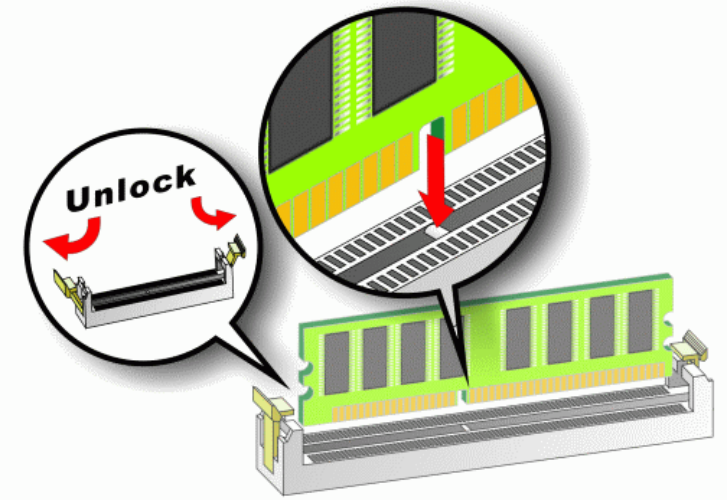


Figure 5-7: Installing a DIMM

Step 1: **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 5-7**.

Step 2: **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 5-7**.

Step 3: **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-7**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

5.4 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

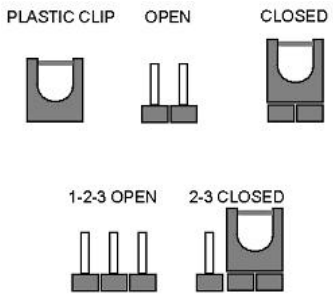


Figure 5-8: Jumper

Before the PCIE-9450 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the PCIE-9450 are listed in **Table 5-1**.

Description	Label	Type
Clear CMOS	JP1	3-pin header

Table 5-1: Jumpers

5.4.1 Clear CMOS Jumper

Jumper Label:	JP1
Jumper Type:	3-pin header
Jumper Settings:	See **Table 5-2**
Jumper Location:	See **Figure 5-9**

If the PCIE-9450 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 5-2**.

AT Power Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 – 3	Clear CMOS Setup	

Table 5-2: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 5-9** below.

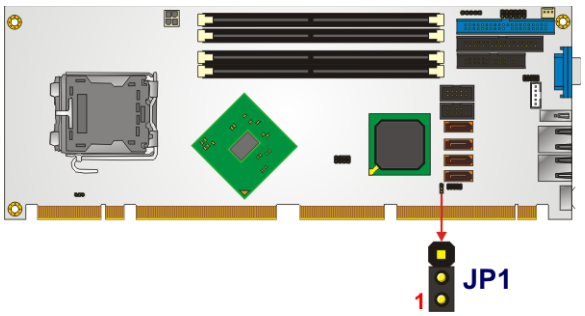


Figure 5-9: Clear CMOS Jumper

5.5 Chassis Installation

5.5.1 Airflow

WARNING

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the PCIE-9450 must have air vents to allow cool air to move into the system and hot air to move out.

The PCIE-9450 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

NOTE

IEI has a wide range of chassis available. Please contact your PCIE-9450 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about the available chassis.

5.5.2 Backplane Installation

Before the PCIE-9450 can be installed into a chassis, a backplane must first be installed. Please refer to the installation instructions that came with the backplane and the chassis.

NOTE:

IEI has a wide range of backplanes available. Please contact your PCIE-9450 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about the available backplanes.

5.5.3 CPU Card Installation

To install the PCIE-9450 CPU card onto the backplane, carefully align the CPU card interface connectors with the corresponding socket on the backplane. To do this, please refer to the reference material that came with the backplane. Next, secure the CPU card to the chassis. To do this, please refer to the reference material that came with the chassis.

5.6 Internal Peripheral Device Connections

5.6.1 Peripheral Device Cables

The cables listed in **Table 5-3** are shipped with the PCIE-9450.

Quantity	Type
1	ATA 66/100 flat cable
1	KB/MS PS/2 Y cable
1	RS-232 cable
4	SATA drive cable
2	SATA drive power cable
1	USB cable

Table 5-3: IEI Provided Cables

5.6.2 ATA Flat Cable Connection

The ATA 66/100 flat cable connects to the PCIE-9450 IDE device. Follow the instructions below to connect an IDE HDD to the PCIE-9450.

Step 1: **Locate the IDE connector**. The locations of the IDE device connectors are shown in **Chapter 3**.

Step 2: **Insert the connector**. Connect the IDE cable connector to the onboard connector. See **Figure 5-10**. A key on the front of the cable connector ensures it can only be inserted in one direction.

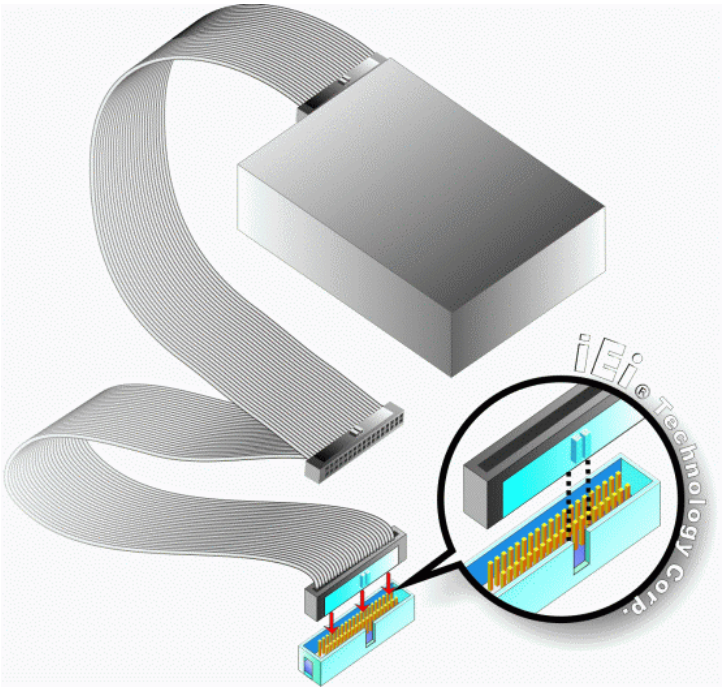


Figure 5-10: IDE Cable Connection

Step 3: **Connect the cable to an IDE device**. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector

5.6.3 Keyboard/Mouse Y-cable Connector

The PCIE-9450 is shipped with a keyboard/mouse Y-cable connector. The keyboard/mouse Y-cable connector connects to a keyboard/mouse connector on the PCIE-9450 and branches into two cables that are each connected to a PS/2 connector, one for a mouse and one for a keyboard. To connect the keyboard/mouse Y-cable connector please follow the steps below.

Step 1: **Locate the connector**. The location of the keyboard/mouse Y-cable connector is shown in **Chapter 3**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the PCIE-9450 keyboard/mouse connector. See **Figure 5-11**.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the keyboard/mouse connector on the PCIE-9450, connect the cable connector to the onboard connectors. See **Figure 5-11**.

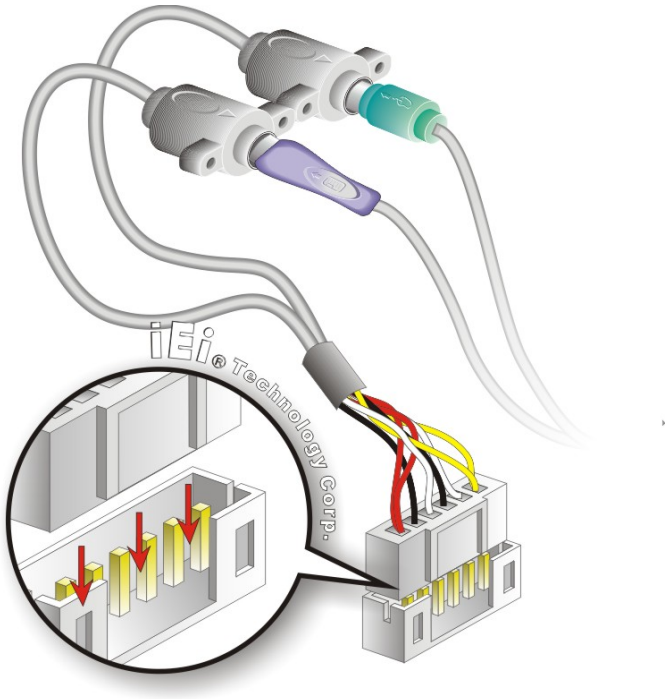


Figure 5-11: Keyboard/mouse Y-cable Connection

Step 4: **Attach PS/2 connectors to the chassis**. The keyboard/mouse Y-cable connector is connected to two PS/2 connectors. To secure the PS/2 connectors to the chassis please refer to the installation instructions that came with the chassis.

Step 5: **Connect the keyboard and mouse**. Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the PS/2 connectors. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

5.6.4 Single RS-232 Cable Connection

The single RS-232 cable consists of one serial port connectors attached to a serial communications cable that is then attached to a D-sub 9 male connector that is mounted onto a bracket. To install the single RS-232 cable, please follow the steps below.

Step 1: **Locate the connector**. The location of the RS-232 connector is shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the connector into the serial port box header. See **Figure 5-12**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

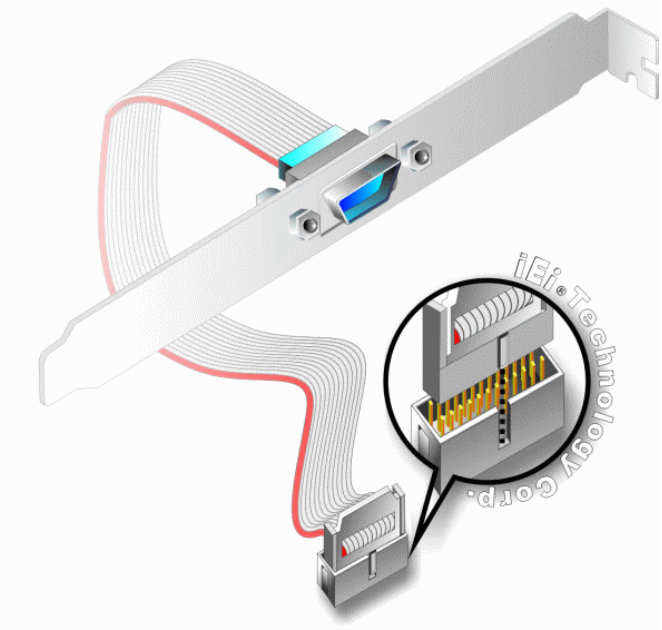


Figure 5-12: Single RS-232 Cable Installation

Step 3: **Secure the bracket**. The single RS-232 connector has one D-sub 9 male connector secured to a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis

5.6.5 SATA Drive Connection

The PCIE-9450 is shipped with SATA drive cables and SATA drive power cable. Follow the steps below to connect the SATA drives to the CPU card.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-13**.

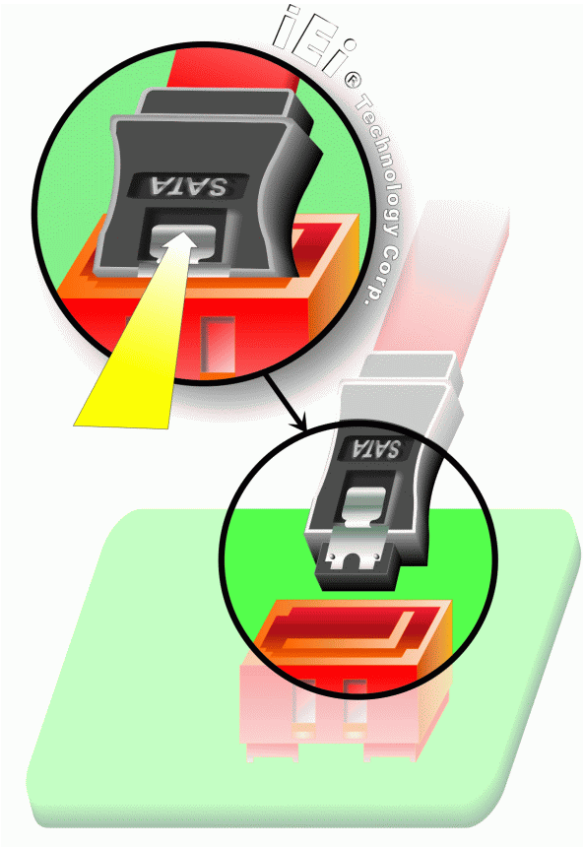


Figure 5-13: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-14**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-14**.

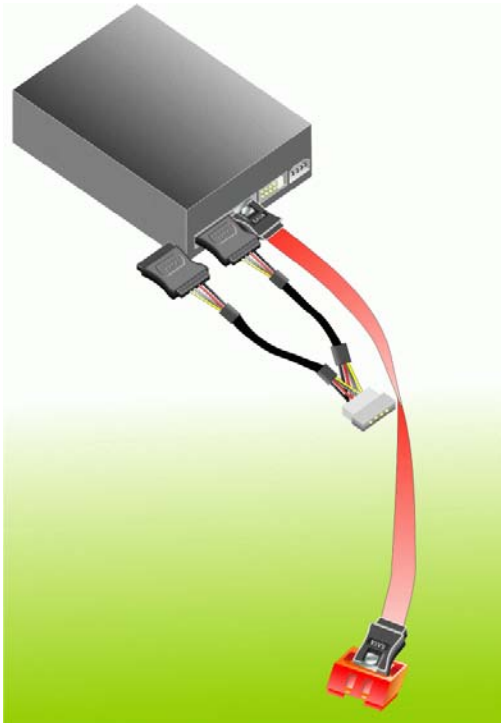


Figure 5-14: SATA Power Drive Connection

5.6.6 USB Cable Connectors

The PCIE-9450 is shipped with a dual USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 3**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the PCIE-9450 USB connector.

Step 3: **Insert the cable connectors** Once the cable connectors are properly aligned with the USB connectors on the PCIE-9450, connect the cable connectors to the onboard connectors. See **Figure 5-15**.

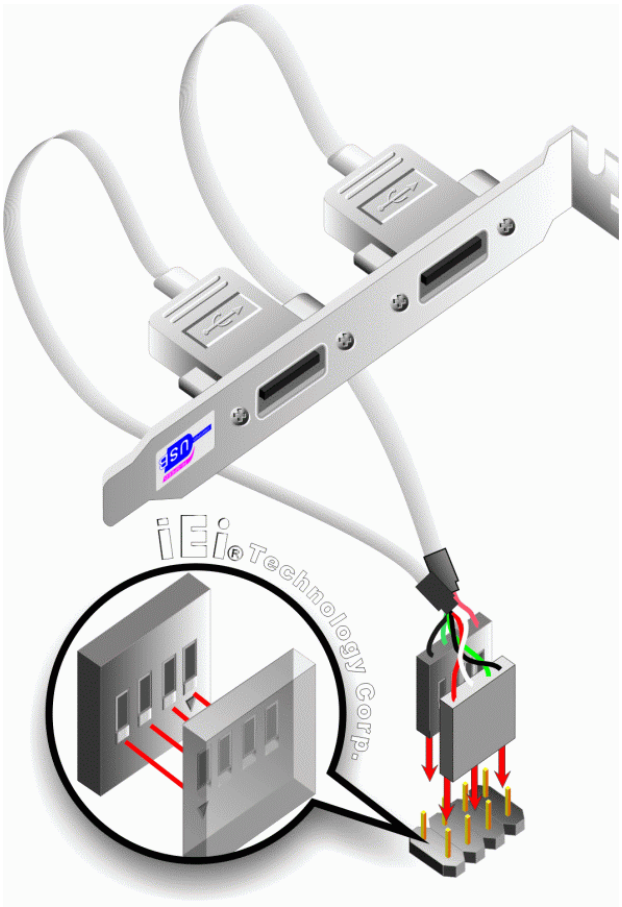


Figure 5-15: Dual USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

5.7 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Mouse and keyboard
- RJ-45 Ethernet cable connectors
- USB devices
- VGA monitors

To install these devices, connect the corresponding cable connector from the actual device to the corresponding PCIE-9450 external peripheral interface connector making sure the pins are properly aligned.

5.7.1 PS/2 Y Cable Connection

The PCIE-9450 has a single PS/2 connector on the external peripheral interface panel. The PS/2 connector is connected to a keyboard and mouse Y cable. To connect a keyboard to the PCIE-9450, please follow the instructions below.

Step 1: **Locate the PS/2 connector**. The location of the PS/2 connector is shown in **Chapter 3**.

Step 2: **Align the PS/2 connector**. Align the PS/2 connector on the keyboard cable with the PS/2 connector on the external peripheral interface.

Step 3: **Insert the PS/2 connector** Once the connectors are properly, insert the PS/2 Y cable connector into the PS/2 cable connector on the PCIE-9450.
See **Figure 5-16.**

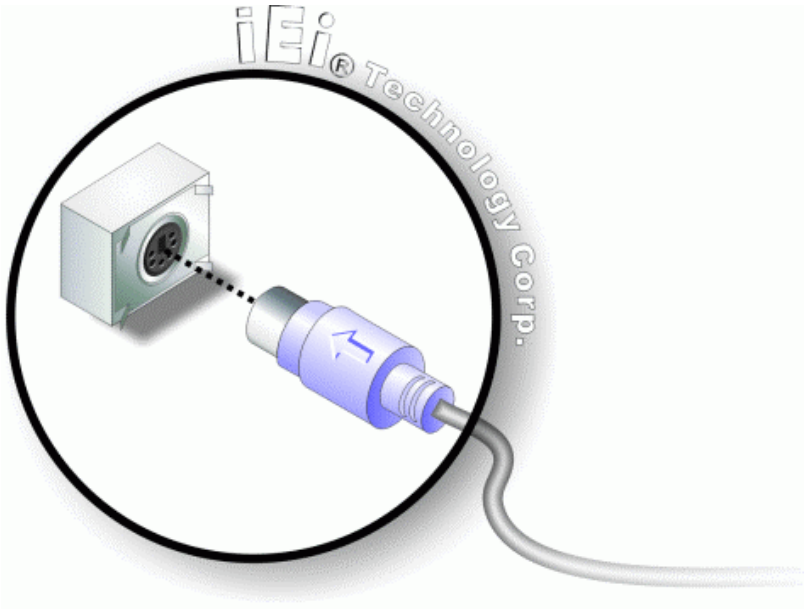


Figure 5-16: PS/2 Connector

5.7.2 RJ-45 Ethernet Connection

The PCIE-9450 RJ-45 Ethernet connector on the external peripheral interface panel is connected to a LAN cable RJ-45 connector (**Figure 5-17**).

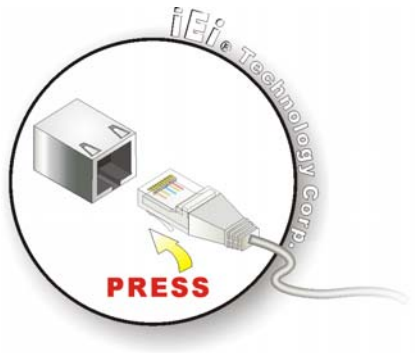


Figure 5-17: RJ-45 Connector

5.7.3 USB Connection

The external USB connector provides easier and quicker access to external USB devices. The external USB connector is a standard connector and can easily be connected to other USB devices.

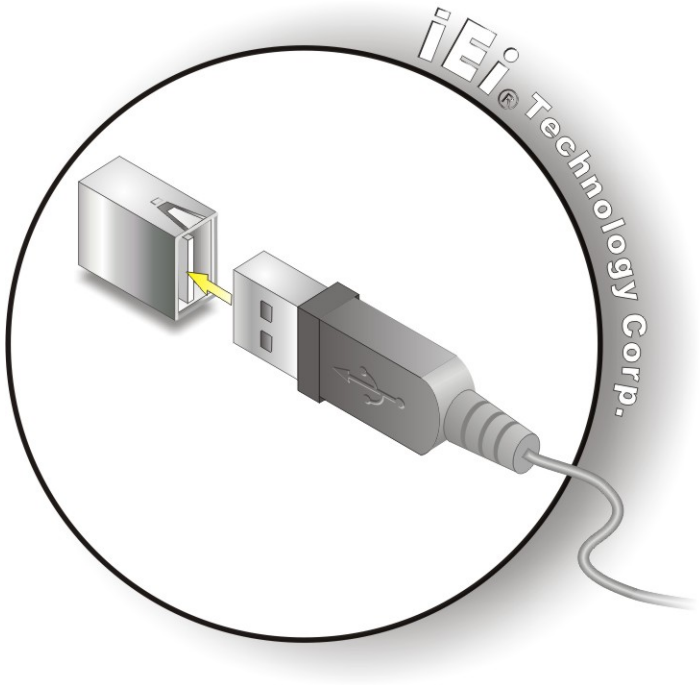


Figure 5-18: USB Connector

5.7.4 VGA Monitor Connection

The PCIE-9450 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the PCIE-9450, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the PCIE-9450. See **Figure 5-19**.

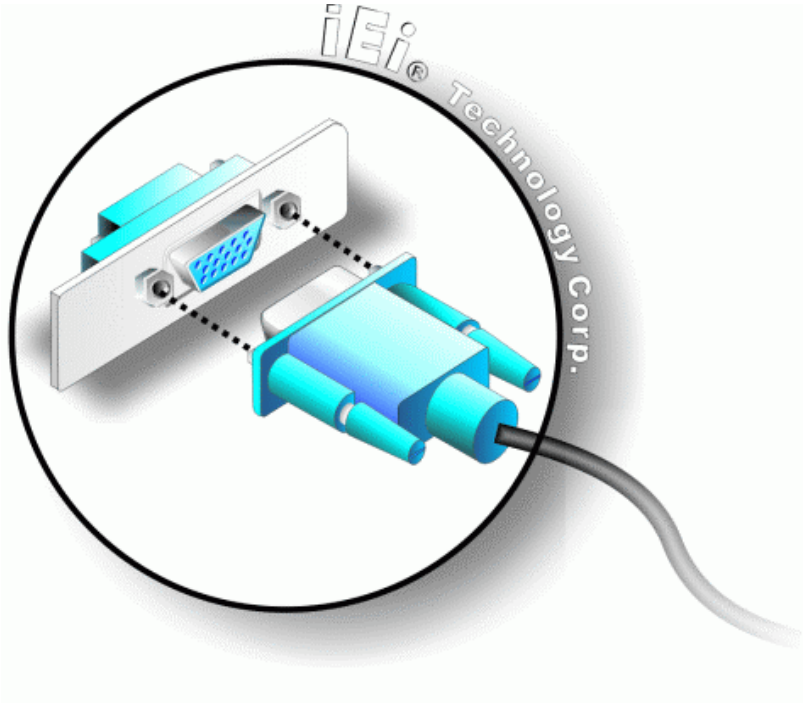


Figure 5-19: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

Chapter

6

AMI BIOS

6.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

6.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the DELETE key is pressed, restart the computer and try again.

6.1.2 Using Setup

Use the arrow keys to highlight items, press ENTER to select, use the PageUp and PageDown keys to change entries, press F1 for help and press ESC to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

Key	Function
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 6-1: BIOS Navigation Keys

6.1.3 Getting Help

When F1 is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press ESC or the F1 key again.

6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Section 0**.

6.1.5 BIOS Menu Bar

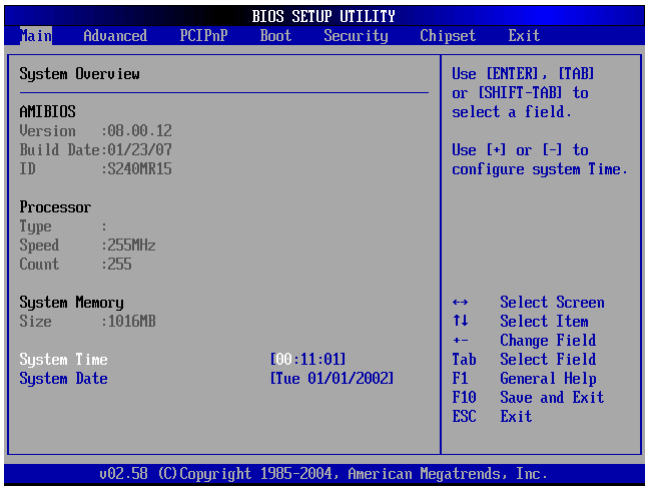
The menu bar on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

6.2 Main

The Main BIOS menu (**BIOS Menu 1**) appears when the BIOS Setup program is entered. The Main menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ **System Overview**

The System Overview lists a brief summary of different system components. The fields in System Overview cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications
  - **Type**: Names the currently installed processor
  - **Speed**: Lists the processor speed
  - **Count**: The number of CPUs on the motherboard
- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the System Time option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the System Date option to set the system date. Manually enter the day, month and year.

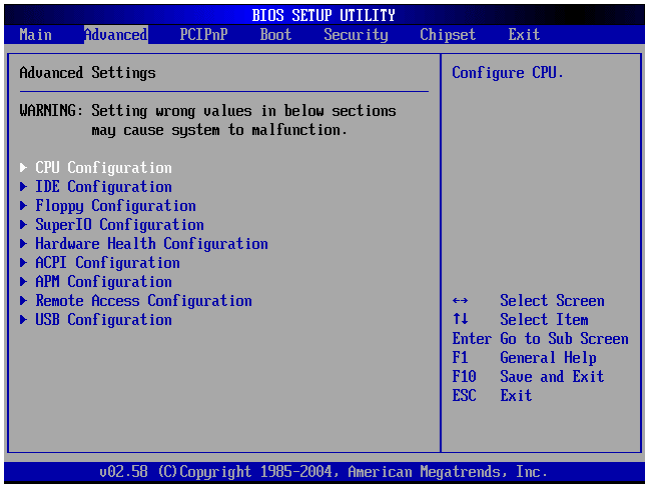
6.3 Advanced

Use the Advanced menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

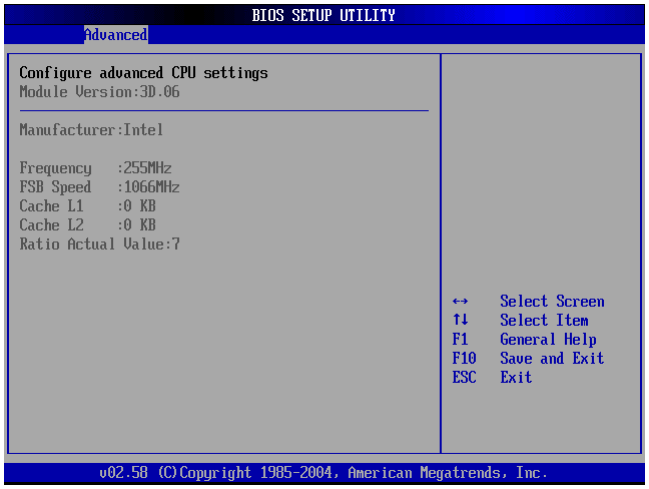
- **CPU Configuration** (see **Section 6.3.1**)
- **IDE Configuration** (see **Section 6.3.2**)
- **Floppy Configuration** (see **Section 6.3.3**)
- **SuperIO Configuration** (see **Section 6.3.3**)
- **Hardware Health Configuration** (see **Section 6.3.5**)
- **ACPI Configuration** (see **Section 6.3.6**)
- **AMP Configuration** (see **Section 6.3.7**)
- **Remote Access Configuration** (see **Section 6.3.8**)
- **USB Configuration** (see **Section 6.3.9**)



BIOS Menu 2: Advanced

6.3.1 CPU Configuration

Use the CPU Configuration menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.



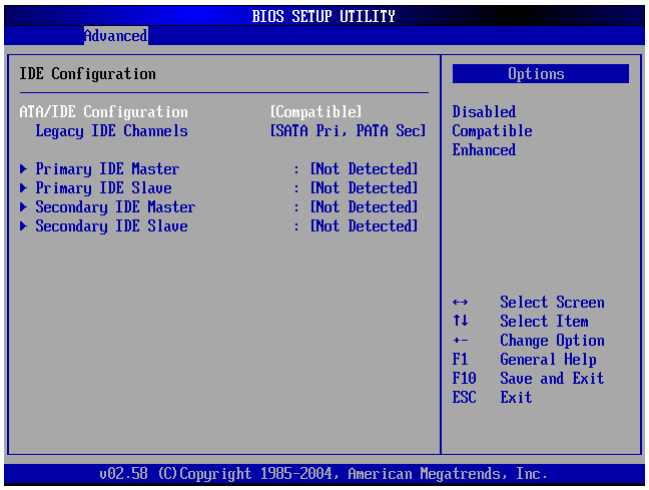
BIOS Menu 3: CPU Configuration

The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- **Module Version**: xx.xx
- **Manufacturer**: Lists the name of the CPU manufacturer
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size
- **Ratio Actual Value**: Displays the ratio at which the CPU is actually operating

6.3.2 IDE Configuration

Use the IDE Configuration menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

➔ **ATA/IDE Configurations [Compatible]**

Use the **ATA/IDE Configurations** option to configure the ATA/IDE controller.

➔ **Disabled** Disables the on-board ATA/IDE controller.

➔ **Compatible** Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

➔ **Enhanced** **DEFAULT** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

➔ **Legacy IDE Channels [PATA Pri, SATA Sec]**

Use the **Legacy IDE Channels** option to determine how SATA channels and PATA channels are ordered.

➔ **SATA Only**		Enables SATA channels only.
➔ **PATA Pri, SATA Sec**	**DEFAULT**	Puts SATA channels behind PATA channels.
➔ **SATA Pri, PATA sec**		Puts SATA channels before PATA channels.
➔ **PATA Only**		Enables PATA channels only.

➔ **IDE Master and IDE Slave**

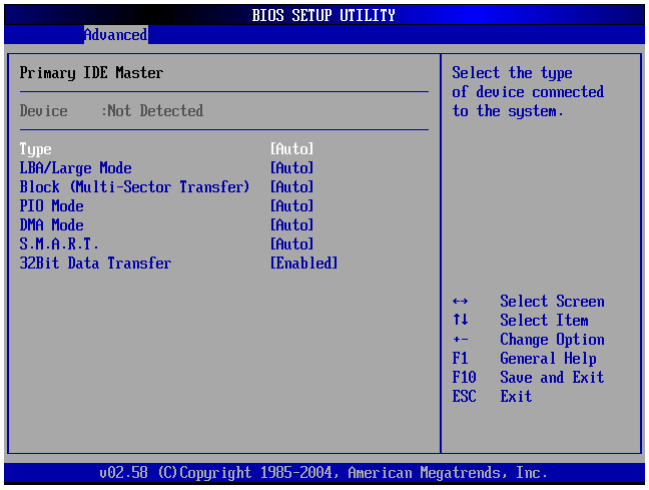
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the IDE Configuration menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The IDE Configuration menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 6.3.2.1** appear.

6.3.2.1 IDE Master, IDE Slave

Use the IDE Master and IDE Slave configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ Auto-Detected Drive Parameters

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.
- **DMA Mode**: Adjust the DMA mode options.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer**: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the Type BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed** BIOS is prevented from searching for an IDE disk drive on the specified channel.

➔ **Auto** **DEFAULT** The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.

➔ **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

➔ **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

- ➔ **ZIP**
- ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the LBA/Large Mode option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled** BIOS is prevented from using the LBA mode control on the specified channel.

➔ **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the Block (Multi Sector Transfer) to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

➔ **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the PIO Mode option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps

➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps

➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps

➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps

➔ **4**		PIO mode 4 selected with a maximum transfer rate of 16.6MBps (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the DMA Mode BIOS selection to adjust the DMA mode options.

➔ **Auto**	**DEFAULT**	BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
➔ **SWDMA0**		Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
➔ **SWDMA1**		Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
➔ **SWDMA2**		Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
➔ **MWDMA0**		Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
➔ **MWDMA1**		Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps
➔ **MWDMA2**		Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps
➔ **UDMA1**		Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
➔ **UDMA1**		Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps

- **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
- **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the S.M.A.R.T option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. S.M.A.R.T predicts impending drive failures. The S.M.A.R.T BIOS option enables or disables this function.

- **Auto** **DEFAULT** BIOS auto detects HDD SMART support.
- **Disabled** Prevents BIOS from using the HDD SMART feature.
- **Enabled** Allows BIOS to use the HDD SMART feature

➔ **32Bit Data Transfer [Enabled]**

Use the 32Bit Data Transfer BIOS option to enables or disable 32-bit data transfers.

- **Disabled** Prevents the BIOS from using 32-bit data transfers.
- **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

6.3.3 Floppy Configuration

Use the Floppy Configuration menu to configure the floppy disk drive connected to the system.

BIOS Menu 6: IDE Master and IDE Slave Configuration

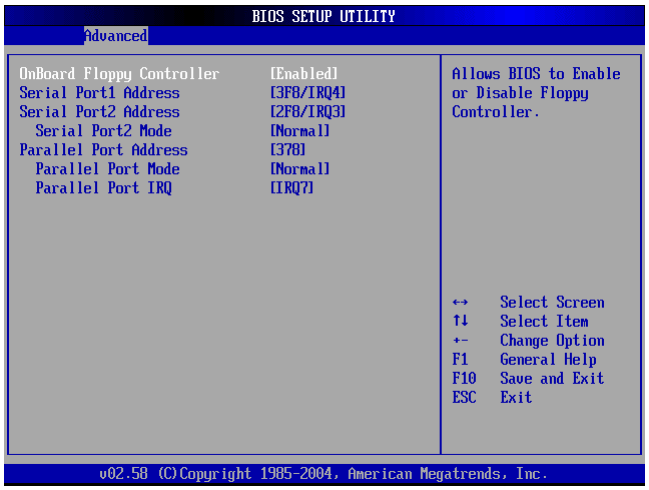
➔ **Floppy A/B**

Use the Floppy A/B option to configure the floppy disk drive. Options are listed below:

- Disabled
- 360 KB 51/4”
- 1.2 MB 51/4”
- 720 KB 31/2”
- 1.44 MB 31/2’
- 2.88 MB 31/2”

6.3.4 Super IO Configuration

Use the Super IO Configuration menu (**BIOS Menu 7**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 7: Super IO Configuration

➔ **OnBoard Floppy Controller [Enabled]**

Use the OnBoard Floppy Controller to enable or disable the floppy controller. If a floppy disk is not being used in the system, disabling this option frees up system resources that can be redirected elsewhere in the system.

➔ **Disabled** Allows BIOS to disable the floppy controller

➔ **Enabled** **DEFAULT** Allows BIOS to enable the floppy controller

➔ **Serial Port1 Address [3F8/IRQ4]**

Use the Serial Port1 Address option to select the Serial Port 1 base address.

➔ **Disabled** No base address is assigned to Serial Port 1

➔ **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4

- **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the Serial Port2 Address option to select the Serial Port 2 base address.

- **Disabled** No base address is assigned to Serial Port 2
- **2F8/IRQ3** **DEFAULT** Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
- **3E8/IRQ4** Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8/IRQ3** Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Use the Serial Port2 Mode option to select the Serial Port2 operational mode.

- **Normal** **DEFAULT** Serial Port 2 mode is normal
- **IrDA** Serial Port 2 mode is IrDA
- **ASK IR** Serial Port 2 mode is ASK IR

➔ **Parallel Port Address [Disabled]**

Use the Parallel Port Address option to select the parallel port base address.

- **Disabled** **DEFAULT** No base address is assigned to the Parallel Port

- ➔ **378** Parallel Port I/O port address is 378
- ➔ **278** Parallel Port I/O port address is 278
- ➔ **3BC** Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

Use the Parallel Port Mode option to select the mode the parallel port operates in.

- ➔ **Normal** **DEFAULT** The normal parallel port mode is the standard mode for parallel port operation.
- ➔ **EPP** The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
- ➔ **ECP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode
- ➔ **ECP+EPP** The parallel port is also compatible with both ECP and EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

Use the Parallel Port IRQ option to set the parallel port interrupt address.

- ➔ **IRQ5** IRQ5 is assigned as the parallel port interrupt address
- ➔ **IRQ7** **DEFAULT** IRQ7 is assigned as the parallel port interrupt address

6.3.5 Hardware Health Configuration

The Hardware Health Configuration menu (**BIOS Menu 8**) shows the operating temperature, fan speeds and system voltages.

BIOS Menu 8: Hardware Health Configuration

➔ **CPU Fan Target Temperature [Disabled]**

Use the **CPU Fan Target Temperature** to specify a CPU operating temperature threshold that, when reached, generates a warning signal. Configuration options are listed below.

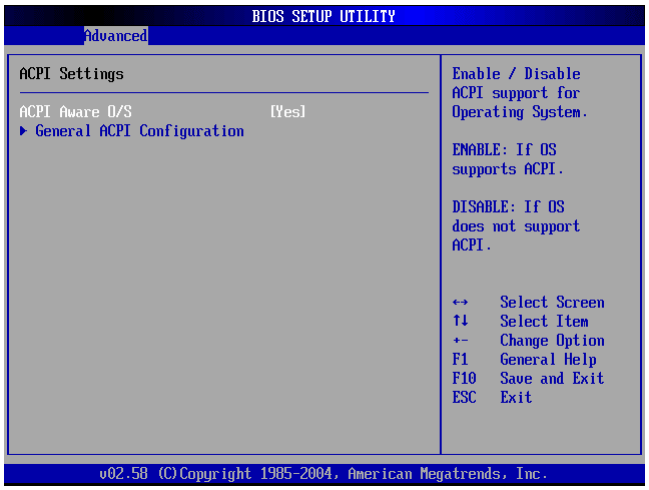
- Disabled **DEFAULT**
- 40°C/104°F
- 50°C/122°F
- 60°C/140°F
- 70°C/158°F

The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - System Temperature
  - CPU Temperature
- **Fan Speeds**: The following cooling fan speeds are monitored
  - System Fan Speed
  - CPU Fan Speed
- **Voltages**: The following system voltages are monitored
  - Vcore
  - +3.30V
  - +12V
  - +1.50V

6.3.6 ACPI Configuration

The ACPI Configuration menu (**BIOS Menu 9**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 9: ACPI Configuration

➔ **ACPI Aware O/S [Yes]**

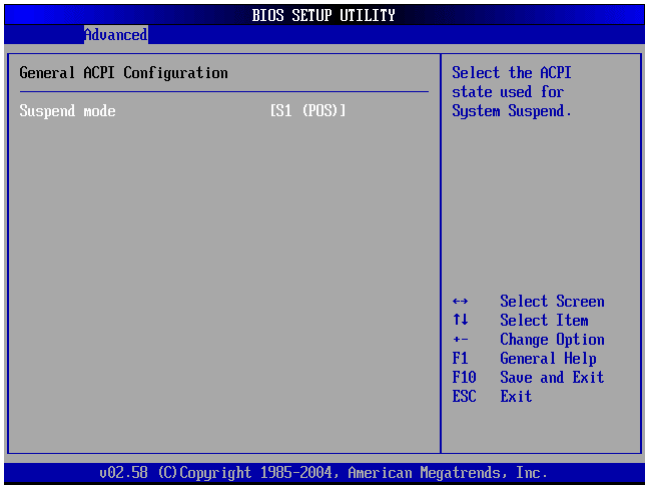
Use the ACPI Aware O/S option to enable the system to configure ACPI power saving options. ACPI can only be implemented if the system OS complies with the ACPI standard. Windows 98, Windows 2000, and Windows XP all comply with ACPI.

➔ **No** Disables the ACPI support for the OS. This selection should be disabled if the OS does not support ACPI

➔ **Yes** **DEFAULT** Enables the ACPI support for the operating system. This selection should be enabled if the OS does support ACPI

6.3.6.1 General ACPI Configuration

Use the General ACPI Configuration menu (**BIOS Menu 10**) to select the ACPI state when the system is suspended.



BIOS Menu 10: General ACPI Configuration

➔ **Suspend Mode [S1(POS)]**

Use the Suspend Mode option to specify the sleep state the system enters when it is not being used.

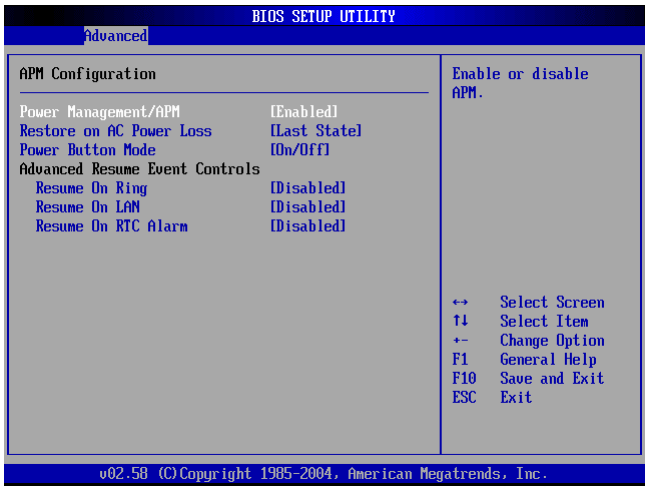
➔ **S1 (POS)** **DEFAULT** The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (STR)** The system enters a S3(STR) sleep state. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

➔ **Auto** The BIOS automatically selects a sleep state for the system.

6.3.7 APM Configuration

The **APM Configuration** menu (**BIOS Menu 11**) allows the advanced power management options to be configured.



BIOS Menu 11: Advanced Power Management Configuration

➔ **Power Management/APM [Enabled]**

Use the **Power Management/APM** BIOS option to enable access to the advanced power management features. If this option is disabled, the only other option on the screen is the **Power Button Mode**.

➔ **Disabled** Disables the Advanced Power Management (APM) feature

➔ **Enabled** **DEFAULT** Enables the APM feature

➔ **Restore on AC Power Loss [Last State]**

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off** The system remains turned off.

➔ **Power On** The system turns on.

➔ **Last State** **DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off** **DEFAULT** When the power button is pressed the system is either turned on or off

➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ **Resume on Ring [Disabled]**

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled** **DEFAULT** Wake event not generated by an incoming call

➔ **Enabled** Wake event generated by an incoming call

➔ **Resume on Lan [Disabled]**

The **Resume on Lan** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the LAN.

➔ **Disabled** **DEFAULT** Wake event not generated by LAN activity

➔ **Enabled** Wake event generated by LAN activity

➔ **Resume On RTC Alarm [Disabled]**

Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

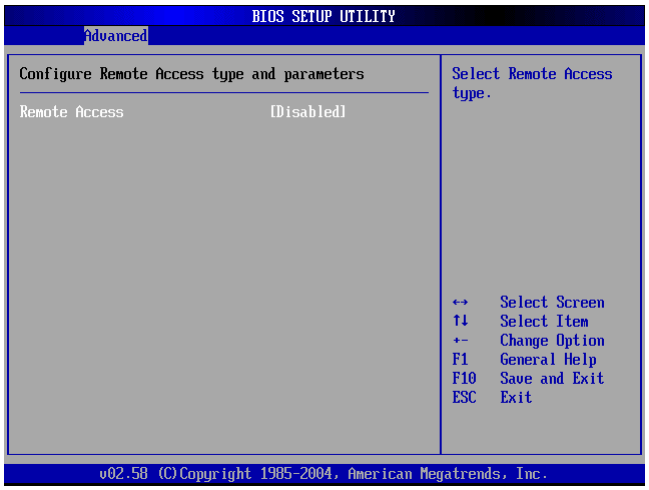
➔ **Enabled** If selected, the following appears with values that can be selected:

- ➔ **RTC Alarm Date (Days)**
- ➔ **System Time**

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

6.3.8 Remote Access Configuration

Use the Remote Access Configuration menu (**BIOS Menu 12**) to configure remote access parameters. The Remote Access Configuration is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 12: Remote Access Configuration

➔ **Remote Access [Disabled]**

Use the Remote Access option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** **DEFAULT** Remote access is disabled.

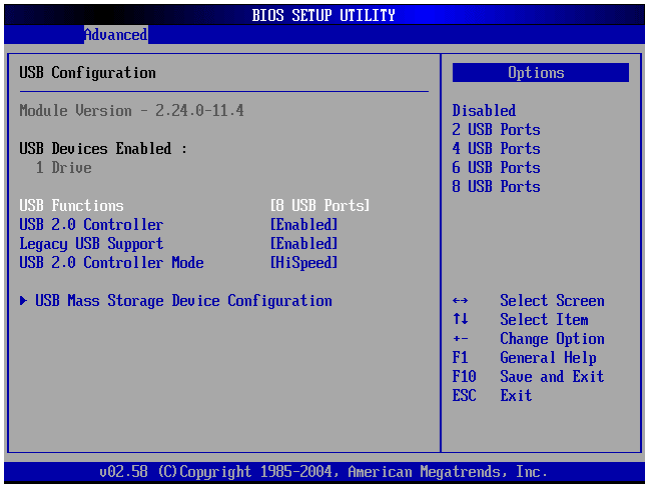
➔ **Enabled** Remote access configuration options shown below appear:

- ➔ **Serial Port Number**
- ➔ **Serial Port Mode**
- ➔ **Flow Control**
- ➔ **Redirection after BIOS POST**
- ➔ **Terminal Type**
- ➔ **VT-UTF8 Combo Key Support**

These configuration options are discussed below.

6.3.9 USB Configuration

Use the USB Configuration menu (**BIOS Menu 13**) to read USB configuration information and configure the USB settings.



BIOS Menu 13: USB Configuration

➔ **USB Configuration**

The USB Configuration field shows the system USB configuration. The items listed are:

- Module Version: x.xx.x-xx.x

➔ **USB Function [8 USB Ports]**

Use the USB Function BIOS option to enable or disable a specified number of USB ports. If only two USB ports are being used, disabling the remaining six USB frees up system resources that can be redirected elsewhere.

➔ **Disabled**		USB function support disabled
➔ **2 USB Ports**		Two USB ports are enabled
4 USB Ports		Four USB ports are enabled
6 USB Ports		Six USB ports are enabled
8 USB Ports	**DEFAULT**	Eight USB ports are enabled

➔ **USB 2.0 Controller [Enabled]**

Use the USB 2.0 Controller BIOS option to enable or disable the USB 2.0 controller

➔ **Disabled**		USB 2.0 controller disabled
➔ **Enabled**	**DEFAULT**	USB 2.0 controller enabled

➔ **Legacy USB Support [Enabled]**

Use the Legacy USB Support BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled**		Legacy USB support disabled
➔ **Enabled**	**DEFAULT**	Legacy USB support enabled
➔ **Auto**		Legacy USB support disabled if no USB devices are connected

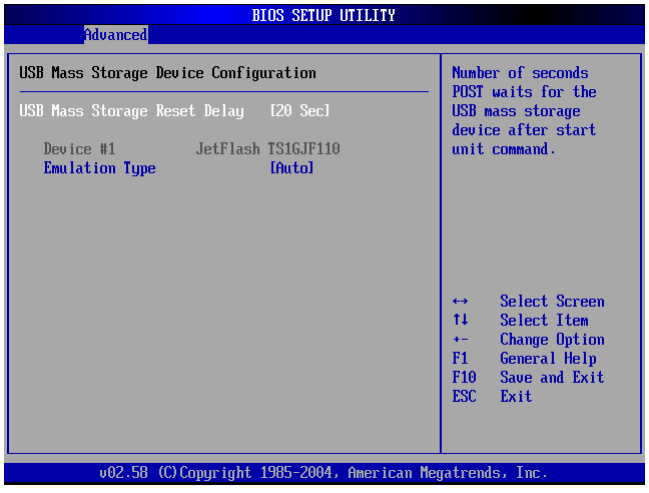
➔ **USB2.0 Controller Mode [HiSpeed]**

The **USB 2.0 Controller Mode** BIOS option sets the speed of the USB 2.0 controller.

➔ **FullSpeed**		The controller is capable of operating at full speed (12Mbits/second)
➔ **HiSpeed**	**DEFAULT**	The controller is capable of operating at high speed (480Mbits/second)

6.3.9.1 USB Mass Storage Device Configuration

Use the USB Mass Storage Device Configuration menu (**BIOS Menu 14**) to configure USB mass storage class devices.


BIOS SETUP UTILITY
Advanced
USB Mass Storage Device Configuration
USB Mass Storage Reset Delay [20 Sec]
Device #1 JetFlash TS1GJF110
Emulation Type [Auto]
Number of seconds POST waits for the USB mass storage device after start unit command.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 14: USB Mass Storage Device Configuration

➔ **USB Mass Storage Reset Delay [20 Sec]**

Use the **USB Mass Storage Reset Delay** option to set the number of seconds POST waits for the USB mass storage device after the start unit command.

➔ **10 Sec**		POST waits 10 seconds for the USB mass storage device after the start unit command.
➔ **20 Sec**	**DEFAULT**	POST waits 20 seconds for the USB mass storage device after the start unit command.
➔ **30 Sec**		POST waits 30 seconds for the USB mass storage device after the start unit command.
➔ **40 Sec**		POST waits 40 seconds for the USB mass storage device after the start unit command.

➔ **Device ##**

The **Device##** field lists the USB devices that are connected to the system.

➔ **Emulation Type [Auto]**

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.

NOTE:

Please note that the device's formatted type and the emulation type provided by the BIOS must match for a device to boot properly. If both types do not match then device's behavior is undefined. To make sure both types match, format the device using BIOS INT13h calls after selecting the proper emulation option in BIOS setup. The FORMAT utility provided by Microsoft® MS-DOS®, Microsoft® Windows® 95, and Microsoft® Windows® 98 can be used for this purpose.

➔ **Auto**	**DEFAULT**	BIOS auto-detects the current USB.
➔ **Floppy**		The USB device will be emulated as a floppy drive. The device can be either A: or B: responding to INT13h calls that return DL = 0 or DL = 1 respectively.
➔ **Forced FDD**		Allows a hard disk image to be connected as a floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.
➔ **Hard Disk**		Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.
➔ **CDROM**		Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this option.

6.4 PCI/PnP

Use the PCI/PnP menu (**BIOS Menu 15**) to configure advanced PCI and PnP settings.

WARNING:

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.

BIOS Menu 15: PCI/PnP Configuration

➔ **Clear NVRAM [No]**

Use the Clear NVRAM option to specify if the NVRAM (Non-Volatile RAM) is cleared when the power is turned off.

➔ **No** **DEFAULT** System does not clear NVRAM during system boot

➔ **Yes** System clears NVRAM during system boot

➔ **Plug & Play O/S [No]**

Use the Plug & Play O/S BIOS option to specify whether system plug and play devices are configured by the operating system or the BIOS.

➔ **No** **DEFAULT** If the operating system does not meet the Plug and Play specifications, this option allows the BIOS to configure all the devices in the system.

➔ **Yes** This setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system is running Plug and Play aware operating systems.

➔ **PCI Latency Timer [64]**

Use the PCI Latency Timer option to specify the PCI latency time. The latency time is measured in units of PCI clock cycles for the PCI device latency timer register. Configuration options are:

- 32
- 64 **DEFAULT**
- 96
- 128
- 160
- 192
- 224
- 248

➔ **Allocate IRQ to PCI VGA [Yes]**

Use the Allocate IRQ to PCI VGA option to restrict the system from giving the VGA adapter card an interrupt address.

➔ **Yes** **DEFAULT** Assigns an IRQ to a PCI VGA card if card requests IRQ

➔ **No** Does not assign IRQ to a PCI VGA card even if the card requests an IRQ

➔ **Palette Snooping [Disabled]**

Use the **Palette Snooping** option to enable or disable the palette snooping function.

➔ **Disabled** **DEFAULT** Unless the VGA card manufacturer requires palette snooping to be enabled, this option should be disabled.

➔ **Enabled** PCI devices are informed that an ISA based Graphics device is installed in the system so the ISA based Graphics card functions correctly. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with the adapter card manual first, before modifying the default settings in the BIOS.

➔ **PCI IDE BusMaster [Disabled]**

Use the **PCI IDE BusMaster** BIOS option to enable or prevent PCI IDE busmastering.

➔ **Disabled** **DEFAULT** Busmastering is prevented

➔ **Enabled** IDE controller on the PCI local bus has mastering capabilities

➔ **OffBoard PCI/ISA IDE Card [Auto]**

Use the Off Board PCI/ISA IDE Card BIOS option to select the OffBoard PCI/ISA IDE Card.

➔ **Auto** **DEFAULT** The location of the Off Board PCI IDE adapter card is automatically detected by the AMIBIOS.

➔ **PCI Slot 1** PCI Slot 1 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 1.

➔ **PCI Slot 2** PCI Slot 2 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 2.

➔ **PCI Slot 3** PCI Slot 3 is selected as the location of the OffBoard

PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 3.

➔ **PCI Slot 4** PCI Slot 4 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 4.

➔ **PCI Slot 5** PCI Slot 5 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 5.

➔ **PCI Slot 6** PCI Slot 6 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 6.

➔ **IRQ# [Available]**

Use the IRQ# address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11

- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the DMA Channel# option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available**	**DEFAULT**	The specified DMA is available to be used by PCI/PnP devices
➔ **Reserved**		The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

➔ **Reserved Memory Size [Disabled]**

Use the Reserved Memory Size BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔ **Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔ **16K**		16KB reserved for legacy ISA devices
➔ **32K**		32KB reserved for legacy ISA devices
➔ **64K**		54KB reserved for legacy ISA devices

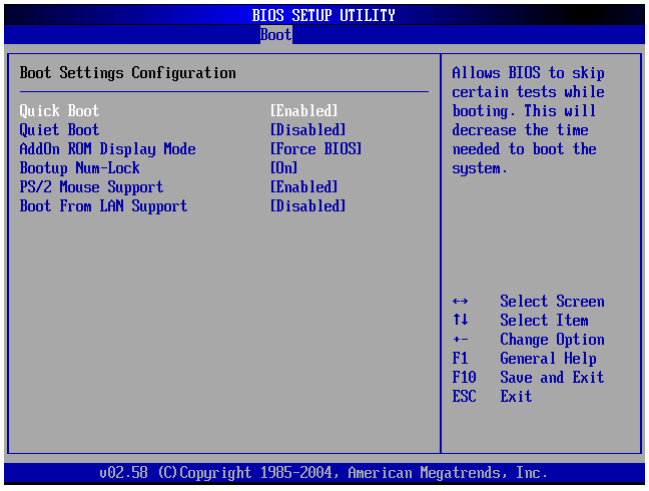
6.5 Boot

Use the Boot menu (**BIOS Menu 16**) to configure system boot options.

BIOS Menu 16: Boot

6.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (**BIOS Menu 17**) to configure advanced system boot options.


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
PS/2 Mouse Support [Enabled]
Boot From LAN Support [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 17: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the Quick Boot BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the Quiet Boot BIOS option to select the screen display when the system boots.

➔ **Disabled**	**DEFAULT**	Normal POST messages displayed
➔ **Enabled**		OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the AddOn ROM Display Mode option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**	**DEFAULT**	The system forces third party BIOS to display during system boot.
➔ **Keep Current**		The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the Bootup Num-Lock BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.
➔ **On**	**DEFAULT**	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **PS/2 Mouse Support [Enabled]**

Use the PS/2 Mouse Support option adjusts PS/2 mouse support capabilities.

➔ **Disabled**		PS/2 mouse support is disabled and prevented from using system resources.
➔ **Enabled**	**DEFAULT**	Allows the system to use a PS/2 mouse.
➔ **Auto**		The system auto-adjusts PS/2 mouse support.

➔ **Boot From LAN Support [Disabled]**

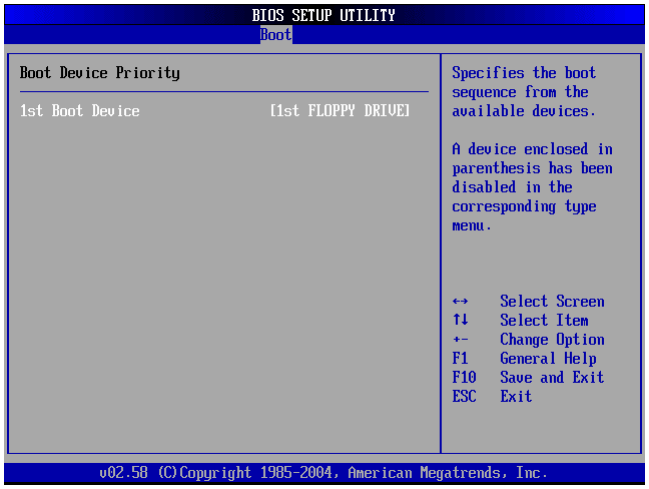
The **BOOT From LAN Support** option enables the system to be booted from a remote system.

➔ **Disabled**	**DEFAULT**	Cannot be booted from a remote system through the LAN
➔ **Enabled**		Can be booted from a remote system through the LAN

6.5.2 Boot Device Priority

Use the Boot Device Priority menu (**BIOS Menu 18**) to specify the boot sequence from the available devices. Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD
- CD/DVD


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device
[1st FLOPPY DRIVE]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 18: Boot Device Priority Settings

6.5.3 Removable Drives

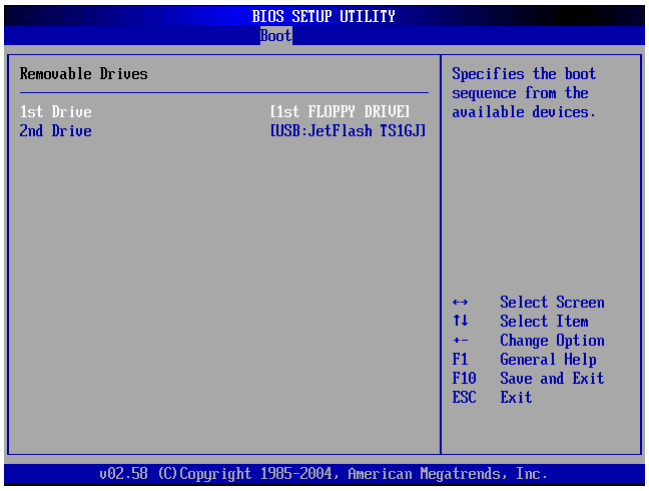
Use the Removable Drives menu (**BIOS Menu 19**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive [1st FLOPPY DRIVE]
- 2nd Drive [2nd FLOPPY DRIVE]

NOTE:

Only the drives connected to the system are shown. For example, if only one FDD is connected only "**1st Drive**" is listed.

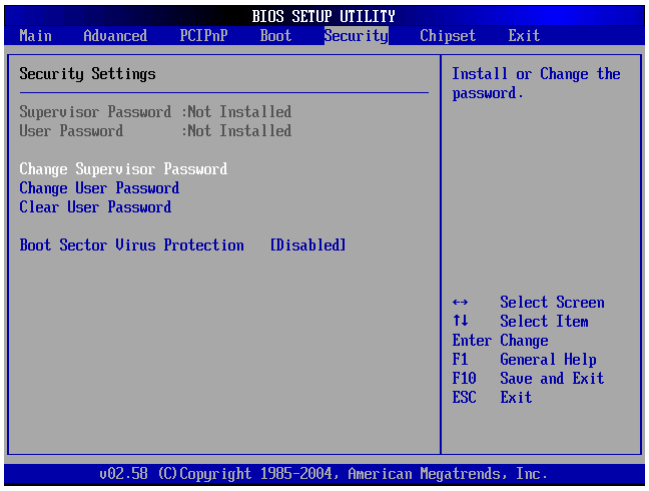
The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.



BIOS Menu 19: Removable Drives

6.6 Security

Use the Security menu (**BIOS Menu 20**) to set system and user passwords.



BIOS Menu 20: Security

➔ **Change Supervisor Password**

Use the Change Supervisor Password to set or change a supervisor password. The default for this option is Not Installed. If a supervisor password must be installed, select this field and enter the password. After the password has been added, Install appears next to Change Supervisor Password.

➔ **Change User Password**

Use the Change User Password to set or change a user password. The default for this option is Not Installed. If a user password must be installed, select this field and enter the password. After the password has been added, Install appears next to Change User Password.

➔ **Clear User Password**

Use the **Clear User Password** to clear a user password.

➔ **Boot Sector Virus Protection [Disabled]**

Use the Boot Sector Virus Protection to enable or disable boot sector protection.

➔	**Disabled**	**DEFAULT**	Disables the boot sector virus protection
➔	**Enabled**		Enables the boot sector virus protection

6.7 Chipset

Use the Chipset menu (**BIOS Menu 21**) to access the NorthBridge and SouthBridge configuration menus.

WARNING:

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below sections may cause system to malfunction.
North Bridge Configuration
South Bridge Configuration
Configure North Bridge features.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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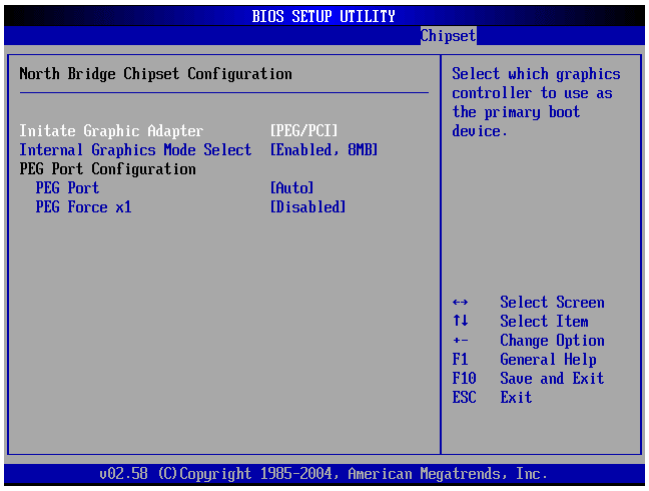
BIOS Menu 21: Chipset

6.7.1 NorthBridge Configuration

Use the NorthBridge Configuration menu (BIOS Menu 22) to configure the northbridge chipset.



BIOS Menu 22:NorthBridge Chipset Configuration

➔ **Initiate Graphic Adapter [PEG/PCI]**

Use the **Initiate Graphic Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PEG/IGD
- PEG/PCI **DEFAULT**
- PCI/PEG
- PCI/IGD

➔ **Internal Graphics Mode Select [Enable, 8MB]**

Use the Internal Graphic Mode Select option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**

➔ **Enable, 1MB** 1MB of memory used by internal graphics device

➔ **Enable, 8MB** **DEFAULT** 8MB of memory used by internal graphics device

➔ **PEG Port [Auto]**

Use the **PEG Port** option to enable or disable the PCI Express port.

➔ **Auto** **DEFAULT** BIOS will search for an installed PCI Express graphics card. If present, the system will boot using the card.

➔ **Onchip VGA** The system boots using the onboard graphics processor.

➔ **Peg Port** The system boots using the PCI Express graphics card.

➔ **PEG Force X1 [Disabled]**

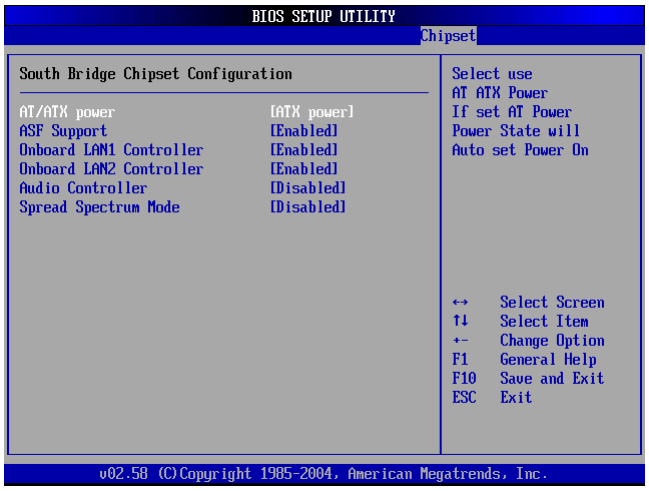
Use the **PEG Force x1** option to convert a PCI express X16 slot into a PCI express X1 slot.

➔ **Disabled** **DEFAULT** PCI express X16 slot runs in normal mode

➔ **Enabled** PCI express X16 slot runs in PCI express X1 mode

6.7.2 SouthBridge Chipset Configuration

The SouthBridge Chipset Configuration menu (**BIOS Menu 23**) the southbridge chipset to be configured.



BIOS Menu 23: SouthBridge Chipset Configuration

➔ **AT/ATX Power [ATX Power]**

Use the **AT/ATX Power** option to select the power supply that is connected to the system.

➔ **ATX**	**DEFAULT**	An ATX power supply is connected to the system
➔ **AT**		An AT power supply is connected to the system

➔ **ASF Support [Enabled]**

Use the **ASF Support** option to control the **Alert Standard Format** (**ASF**) function.

➔ **Auto**		The ASF controller is auto-detected, activated and allowed to communicate with a remote management server.
➔ **Disabled**	**DEFAULT**	The ASF controller is disabled.
➔ **Enabled**		The ASF controller is activated and allowed to communicate with a remote management server.

➔ **Onboard LAN1 Controller [Enabled]**

The **Onboard LAN1 Controller** option enables or disables the on-board LAN1.

➔ **Auto**		The on-board LAN1 controller is automatically detected and enabled
➔ **Enabled**	**DEFAULT**	The on-board LAN1 controller is manually enabled
➔ **Disabled**		The on-board LAN1 controller is manually disabled

➔ **Onboard LAN2 Controller [Enabled]**

The **Onboard LAN2 Controller** option enables or disables the on-board LAN2.

➔ **Auto**		The on-board LAN2 controller is automatically detected and enabled
➔ **Enabled**	**DEFAULT**	The on-board LAN2 controller is manually enabled
➔ **Disabled**		The on-board LAN2 controller is manually disabled

➔ **Audio Controller [Disabled]**

The **Audio Controller** option enables or disables the audio controller.

➔ **Enabled**		The onboard audio controller is automatically detected and enabled.
➔ **Disabled**	**DEFAULT**	The onboard audio controller is disabled.

➔ **Spread Spectrum Mode [Disabled]**

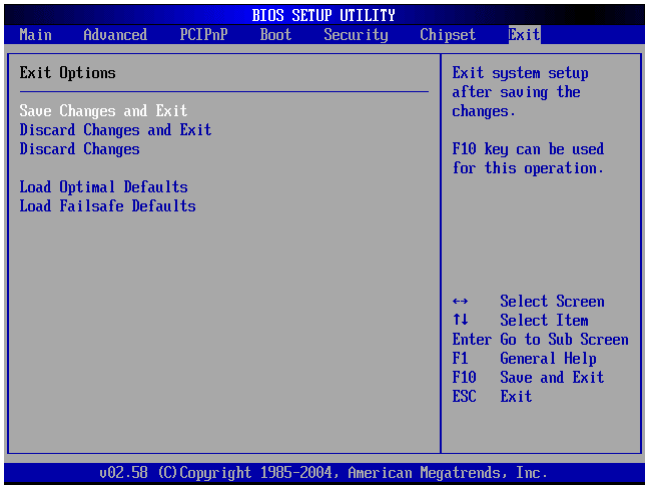
Use the Spread Spectrum option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

➔ **Disabled** **DEFAULT** EMI not reduced

➔ **Enabled** EMI reduced

6.8 Exit

Use the Exit menu (**BIOS Menu 24**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 24:Exit

➔ Save Changes and Exit

Use the Save Changes and Exit option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ Discard Changes and Exit

Use the Discard Changes and Exit option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ Discard Changes

Use the Discard Changes option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the Load Optimal Defaults option to load the optimal default values for each of the parameters on the Setup menus. F9 key can be used for this operation.

➔ **Load Failsafe Defaults**

Use the Load Failsafe Defaults option to load failsafe default values for each of the parameters on the Setup menus. F8 key can be used for this operation.

Chapter

7

Driver Installation

7.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system.

- Chipset driver
- VGA driver
- LAN driver
- Audio driver
- SATA RAID driver
- IDE controller

Installation instructions are given below.

7.2 Driver CD Auto-run

All the drivers for the PCIE-9450 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

If the system does not initiate the "autorun" program when the CD is inserted, click the **Start** button, select **Run**, then type **X:\autorun.exe** (where **X:** is the system CD drive) to access the IEI Driver CD main menu.

Step 2: The driver main menu appears on the screen.

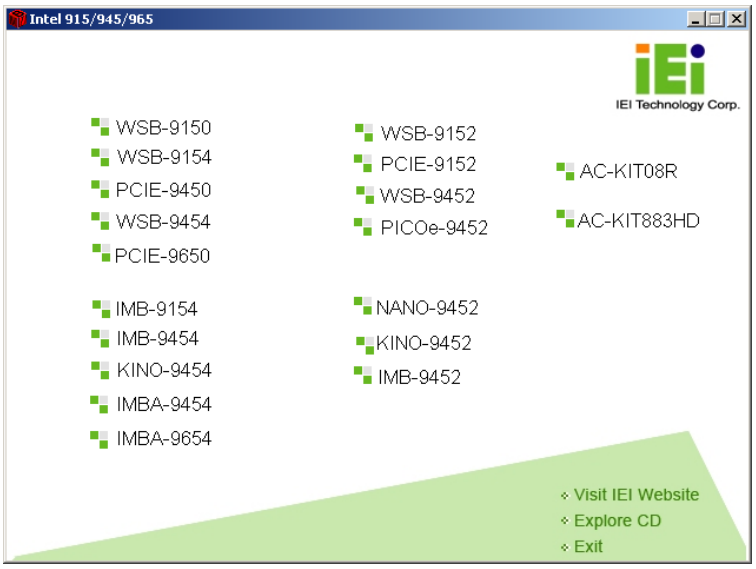

Figure 7-1: Introduction Screen

Step 3: Select PCIE-9450 from the main menu shown in **Figure 7-1**.

Step 4: A new screen with a list of available drivers appears (**Figure 7-2**).

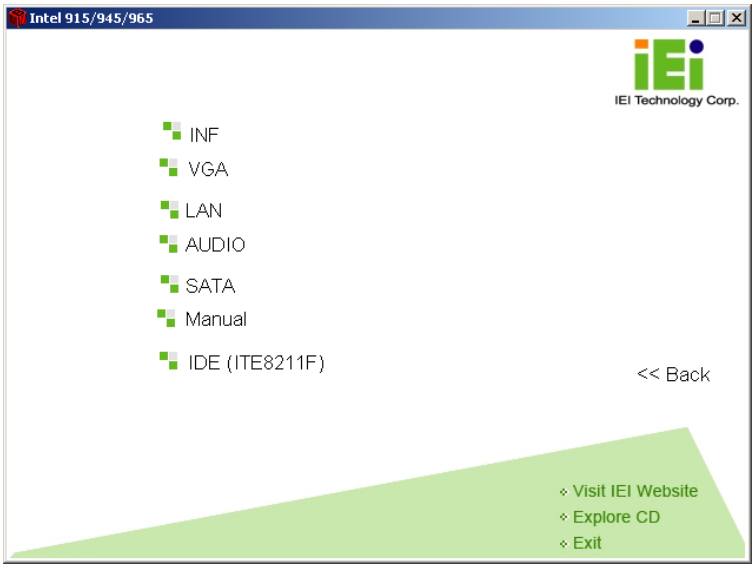

Figure 7-2: Available Drivers

Step 5: Select the driver to install from the list in **Figure 7-2**.

7.3 Chipset Driver Installation

To install the chipset driver, please follow the steps below.

Step 1: Select the INF driver from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-3**).

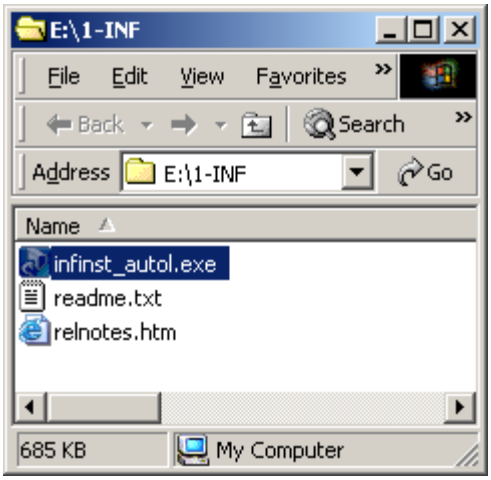

Figure 7-3: Chipset Driver Installation Program

Step 3: Double-click the **infinst_Autol.exe** icon.

Step 4: The welcome screen in **Figure 7-4** appears.

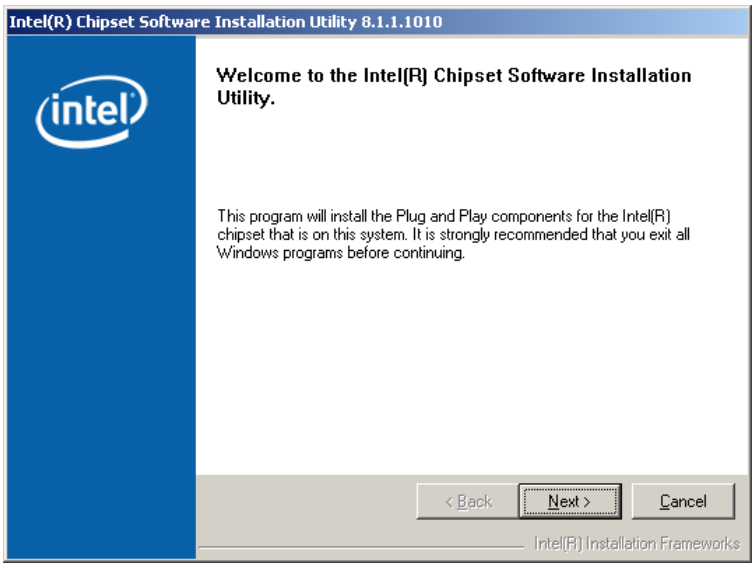
Intel(R) Chipset Software Installation Utility 8.1.1.1010
Welcome to the Intel(R) Chipset Software Installation Utility.
This program will install the Plug and Play components for the Intel(R) chipset that is on this system. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-4: Chipset Driver Installation Welcome Screen

Step 5: Click **NEXT** to continue the installation process.

Step 6: The license agreement in **Figure 7-5** appears.

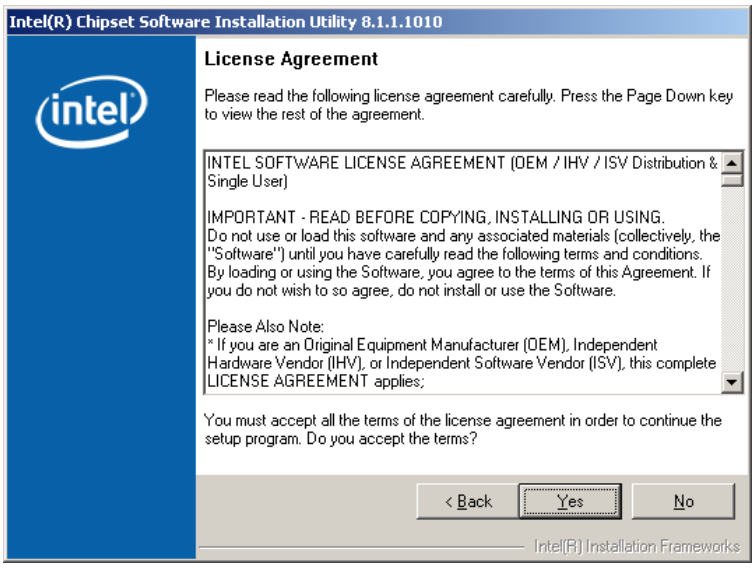
Intel(R) Chipset Software Installation Utility 8.1.1.1010
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-5: Chipset Driver Installation License Agreement

Step 7: Click **YES** to continue the setup.

Step 8: The Readme file in **Figure 7-6** appears.

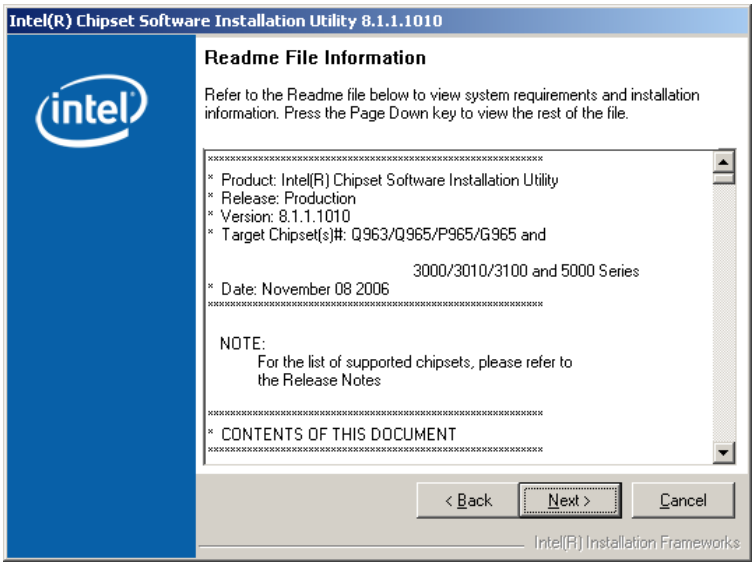
Intel(R) Chipset Software Installation Utility 8.1.1.1010
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
* Product: Intel(R) Chipset Software Installation Utility
* Release: Production
* Version: 8.1.1.1010
* Target Chipset(s)#: Q963/Q965/P965/G965 and
3000/3010/3100 and 5000 Series
* Date: November 08 2006
NOTE:
For the list of supported chipsets, please refer to the Release Notes
* CONTENTS OF THIS DOCUMENT
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-6: Chipset Driver Readme File Information

Step 9: Click **NEXT** to start the driver installation.

Step 10: After the driver installation process is complete, a confirmation screen (**Figure 7-7)** appears.

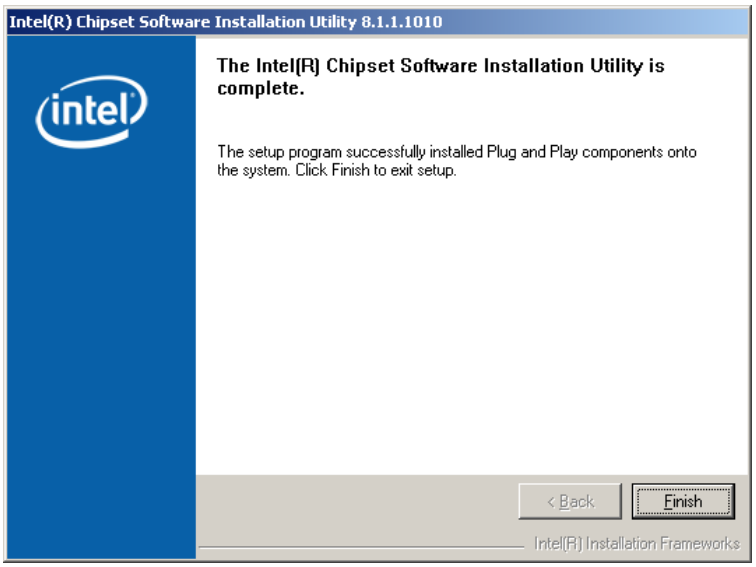
Intel(R) Chipset Software Installation Utility 8.1.1.1010
The Intel(R) Chipset Software Installation Utility is complete.
The setup program successfully installed Plug and Play components onto the system. Click Finish to exit setup.
< Back
Finish
Intel(R) Installation Frameworks

Figure 7-7: Chipset Driver Installation Complete

Step 1: Click **FINISH** to start the driver installation.

7.4 Intel Graphics Media Accelerator Driver

To install the Intel Graphics Media Accelerator driver, please follow the steps below:

Step 2: Select the VGA driver from the list in **Figure 7-2**.

Step 3: A new window opens (**Figure 7-8**).

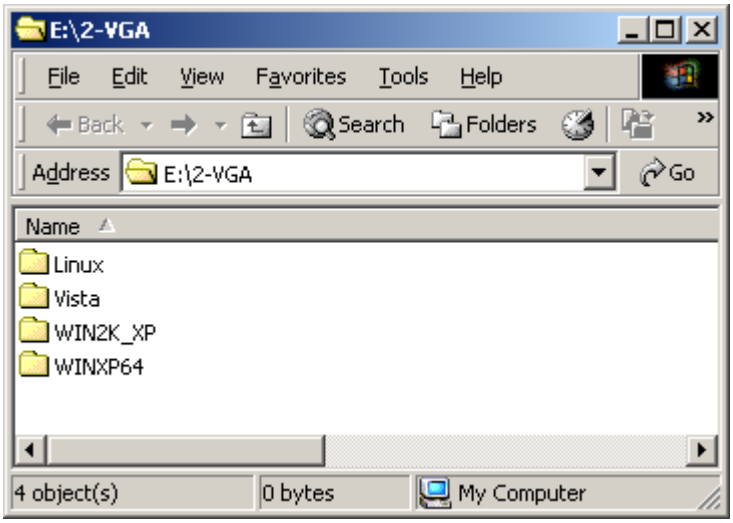

Figure 7-8: Select the Operating System

Step 4: Double-click the appropriate operating system folder.

Step 5: A new window appears (**Figure 7-9**).

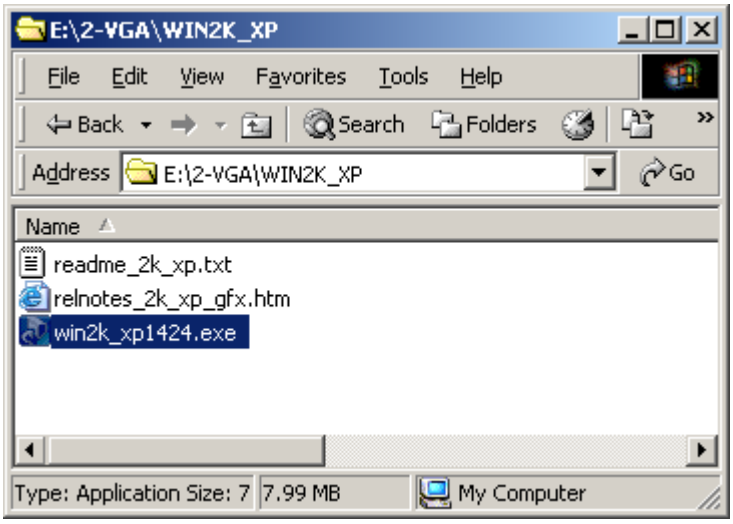

Figure 7-9: VGA Driver

Step 6: Double-click the installation program icon to continue the installation process.

Step 7: The Readme information file shown in **Figure 7-10** appears.

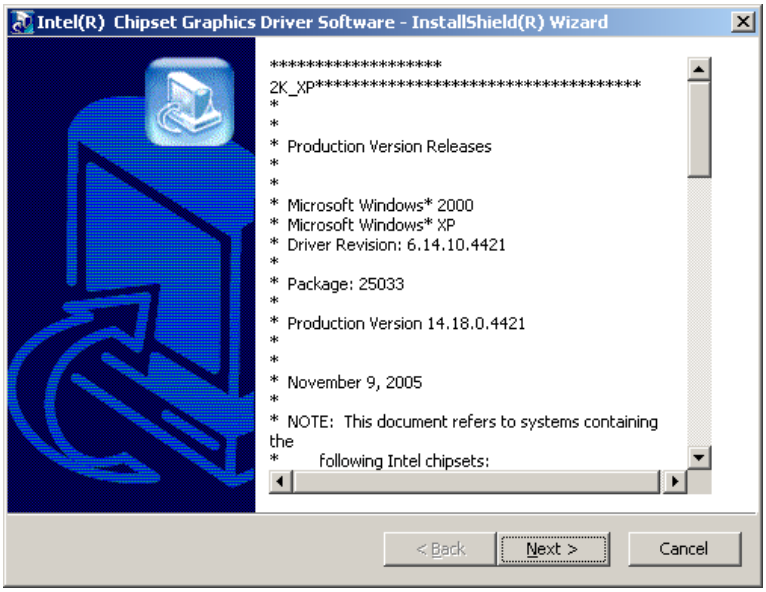

Figure 7-10: Intel® Graphics Media Accelerator InstallShield Wizard

Step 8: Read the Readme file information and click **NEXT** to begin extracting files (**Figure 7-11**).

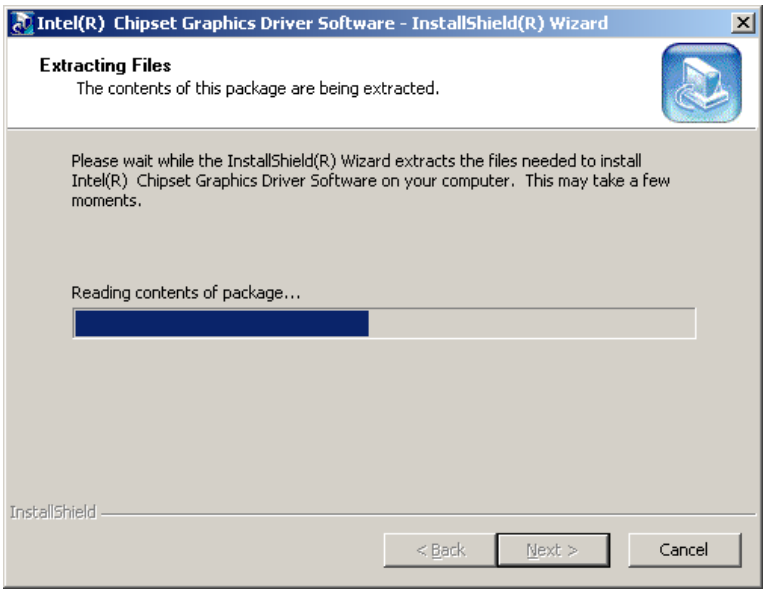
Intel(R) Chipset Graphics Driver Software - InstallShield(R) Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield(R) Wizard extracts the files needed to install Intel(R) Chipset Graphics Driver Software on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

Figure 7-11: InstallShield Wizard Extracting Files

Step 9: The **Graphics Media Accelerator Driver Welcome** screen appears (**Figure 7-12**).

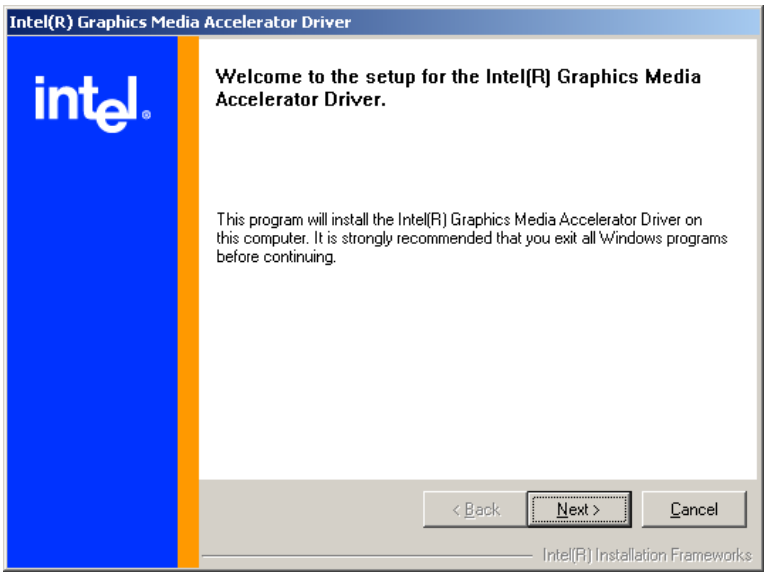
Intel(R) Graphics Media Accelerator Driver
intel
Welcome to the setup for the Intel(R) Graphics Media Accelerator Driver.
This program will install the Intel(R) Graphics Media Accelerator Driver on this computer. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-12: Intel® Graphics Media Accelerator Driver Welcome Screen

Step 10: Click **NEXT** and a license agreement appears (**Figure 7-13**).

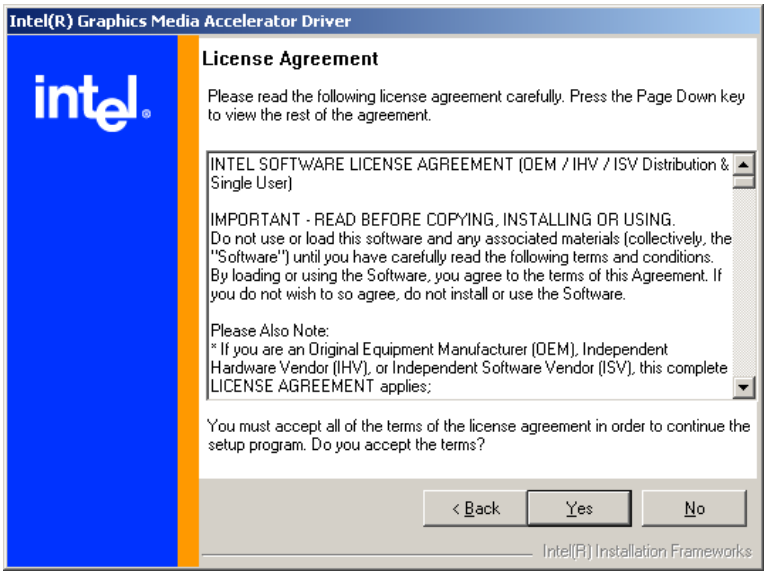
Intel(R) Graphics Media Accelerator Driver
intel
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-13: Intel® Graphics Media Accelerator Driver License Agreement

Step 11: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the installation notice appears (**Figure 7-14**).

Figure 7-14: Intel® Graphics Media Accelerator Driver Installing Notice

Step 12: After the driver installation process is complete, a confirmation screen appears (**Figure 7-15**).

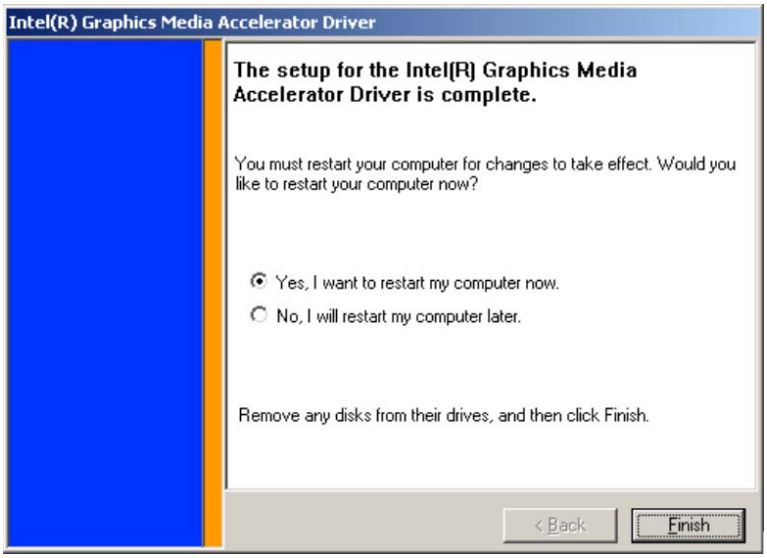
Intel(R) Graphics Media Accelerator Driver
The setup for the Intel(R) Graphics Media Accelerator Driver is complete.
You must restart your computer for changes to take effect. Would you like to restart your computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish.
< Back
Finish

Figure 7-15: Intel® Graphics Media Accelerator Installation Complete

Step 13: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.5 Broadcom LAN Driver (for GbE LAN) Installation

To install the Broadcom LAN driver, please follow the steps below.

Step 1: Open **Windows Control Panel (Figure 7-16)**.

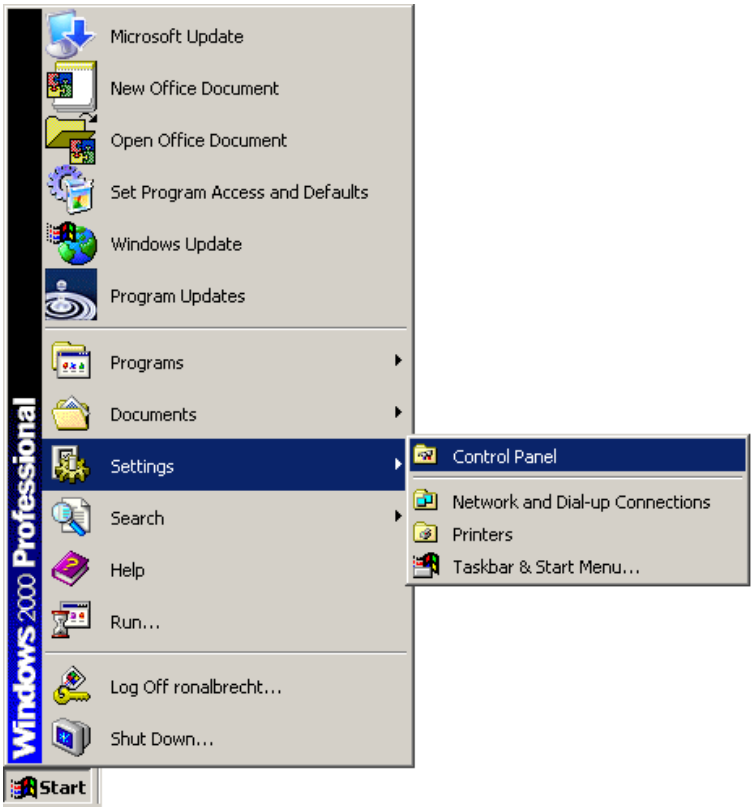

Figure 7-16: Windows Control Panel

Step 2: Double-click the **System** icon (**Figure 7-17**).

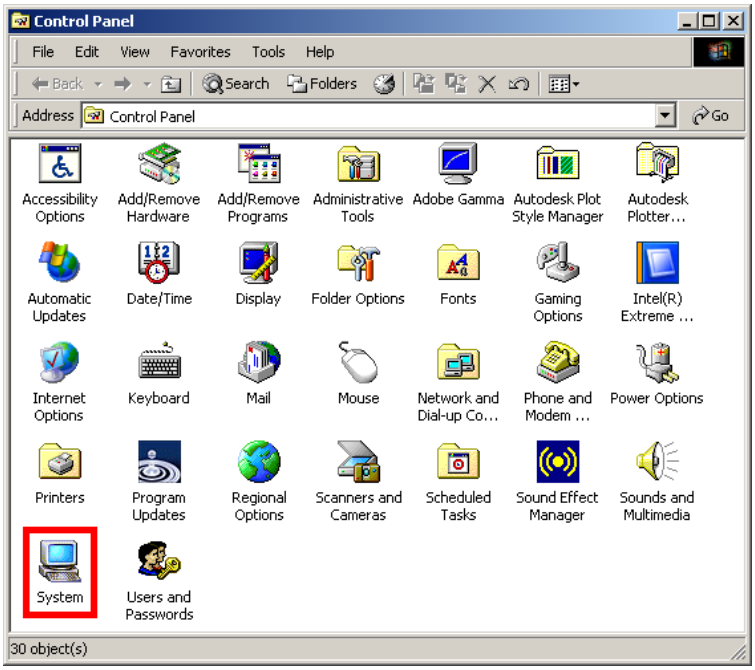

Figure 7-17: System Icon

Step 3: Double-click the **Device Manager** tab (**Figure 7-18**).

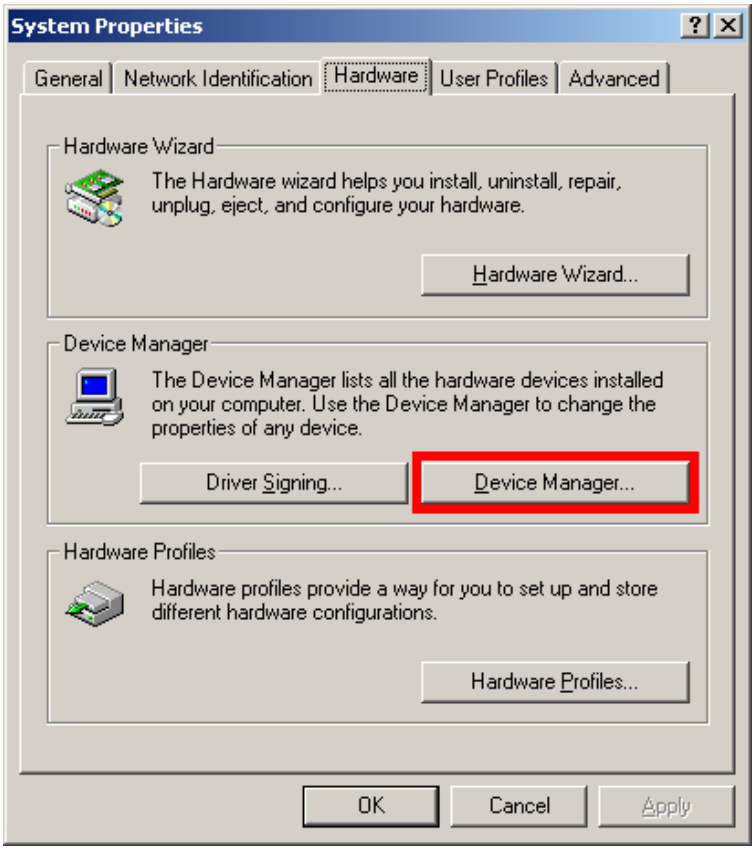
System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

Figure 7-18: Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 7-19**).

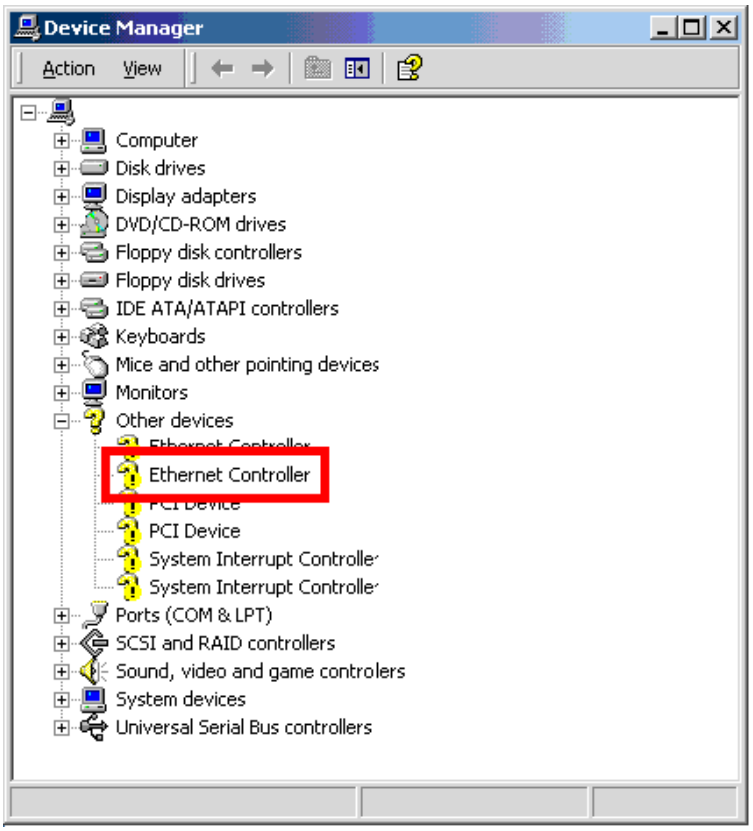

Figure 7-19: Device Manager List

Step 5: Double-click the listed device that has question marks next to it (this means Windows does not recognize the device).

Step 6: The **Device Driver Wizard** appears (**Figure 7-20**).

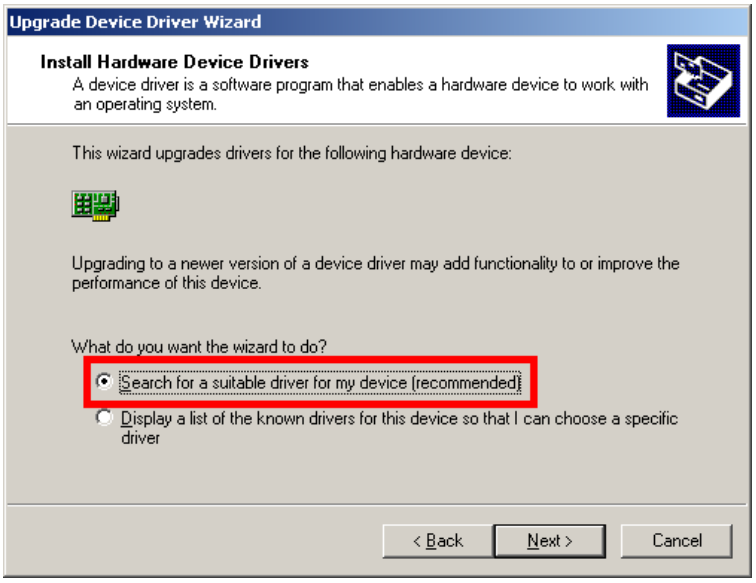
Upgrade Device Driver Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard upgrades drivers for the following hardware device:
Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

Figure 7-20: Search for Suitable Driver

Step 7: Select "**Search for a suitable driver for my device (recommended)**," and click **NEXT** to continue.

Step 8: Select "**Specify a Location**" in the **Locate Driver Files** window (**Figure 7-21**).

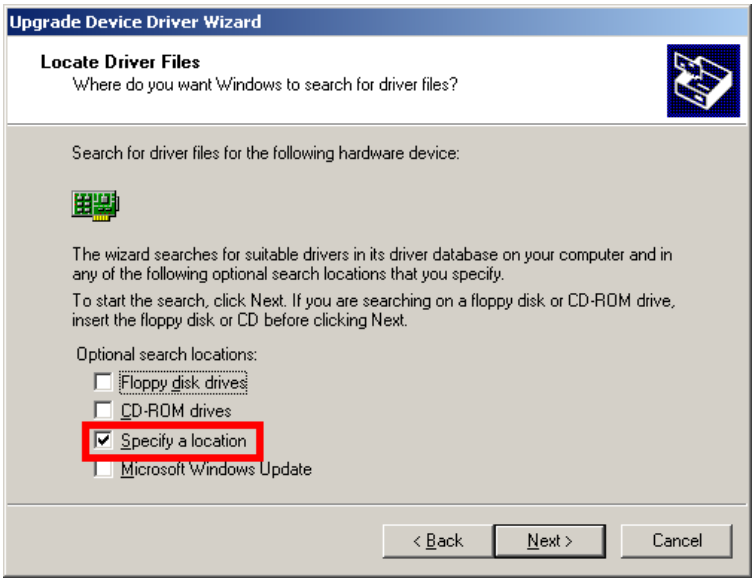
Upgrade Device Driver Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

Figure 7-21: Locate Driver Files

Step 9: Click **NEXT** to continue.

Step 10: The **Locate File** window appears (**Figure 7-22**).

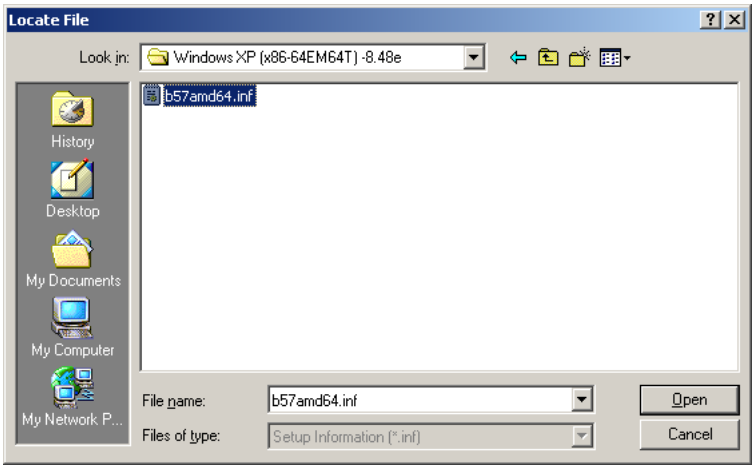

Figure 7-22: Location Browsing Window

Step 11: Select the proper OS folder under the "**X:\3-LAN\BROADCOM BCM57xx Drivers**" directory in the **Locate File** window, where "**X:\"** is the system CD drive.

Step 12: Click **OPEN** to continue. The driver is installed.

7.6 Realtek AC`97 Audio Driver (ALC665) Installation

To install the Realtek AC `97 audio driver, please follow the steps below.

7.6.1 BIOS Setup

Step 1: Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

Step 2: Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [AC`97].

Step 3: Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.6.2 Driver Installation

To install the audio driver please follow the steps below.

Step 1: Select the audio from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-23**).

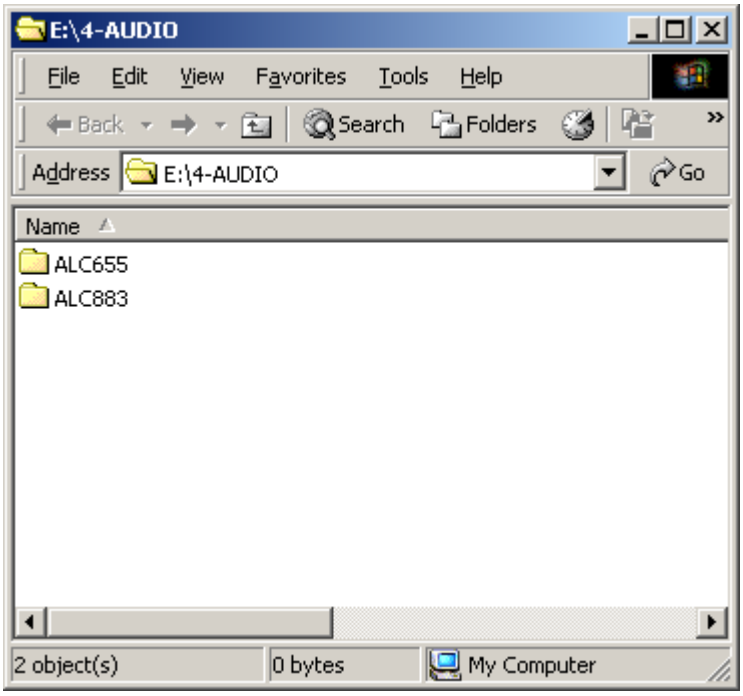

Figure 7-23: Select the Audio CODEC

Step 3: Double-click the ALC665 folder.

Step 4: Double-click the **Setup.exe** program icon in **Figure 7-24**.

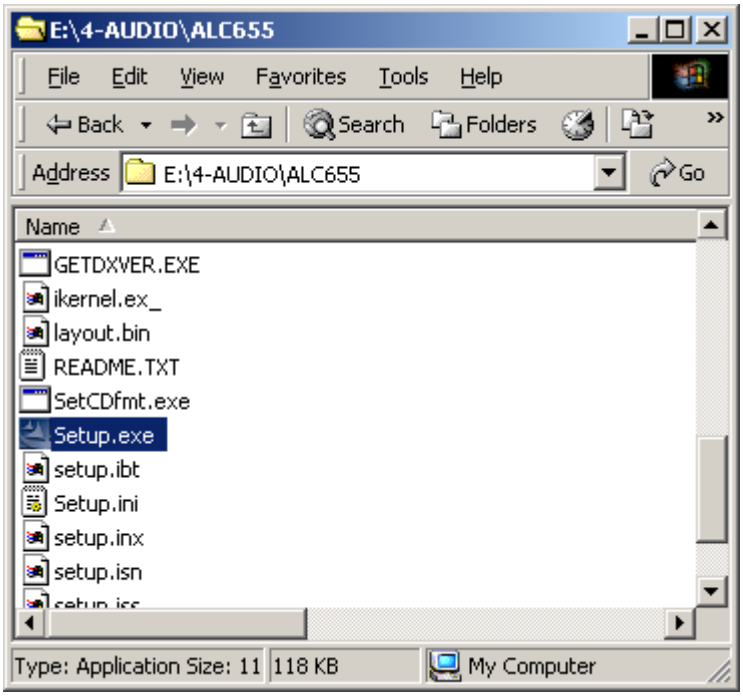

Figure 7-24: Locate the Setup Program Icon

Step 5: The **InstallShield Wizard** is prepared to guide the user through the rest of the process (**Figure 7-25**).

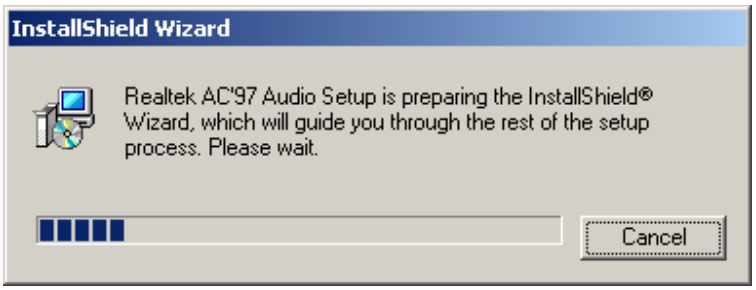
InstallShield Wizard
Realtek AC'97 Audio Setup is preparing the InstallShield® Wizard, which will guide you through the rest of the setup process. Please wait.
Cancel

Figure 7-25: Preparing Setup Screen

Step 6: Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 7-26**).

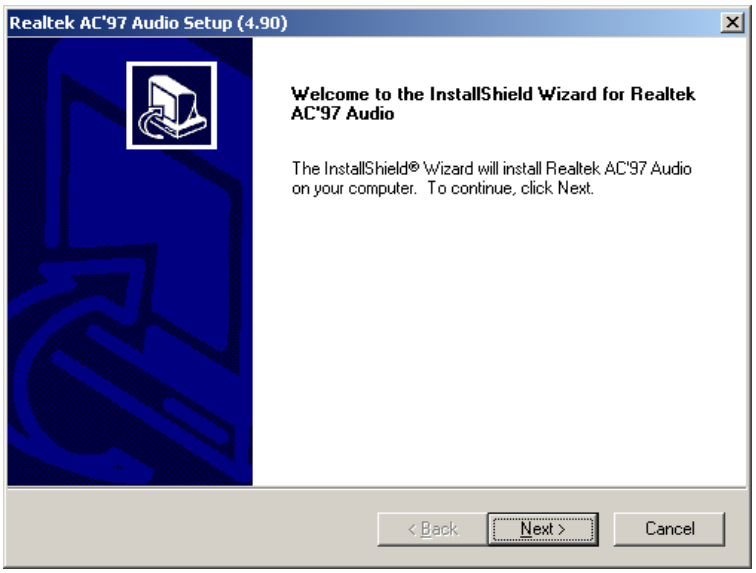
Realtek AC'97 Audio Setup (4.90)
Welcome to the InstallShield Wizard for Realtek AC'97 Audio
The InstallShield® Wizard will install Realtek AC'97 Audio on your computer. To continue, click Next.
< Back
Next >
Cancel

Figure 7-26: InstallShield Wizard Welcome Screen

Step 7: Click **NEXT** to continue the installation.

Step 8: The install shield starts to install the new software as shown in **Figure 7-27**.

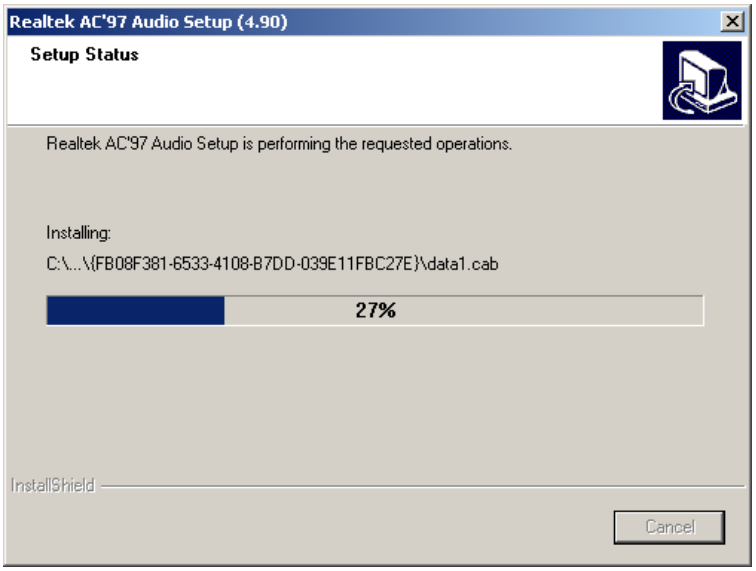

Figure 7-27: Audio Driver Software Configuration

Step 9: At this stage the **Digital Signal Not Found** screen shown in **Figure 7-28** appears.

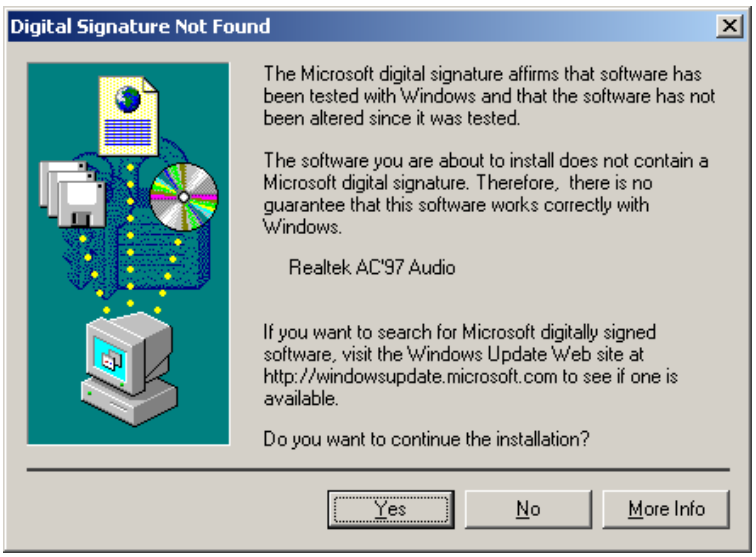
Digital Signature Not Found
The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.
The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.
Realtek AC'97 Audio
If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.
Do you want to continue the installation?
Yes
No
More Info

Figure 7-28: Audio Driver Digital Signal

Step 10: Click **YES** to continue the installation process. The driver installation begins as shown in **Figure 7-29**.

Figure 7-29: Audio Driver Installation

Step 11: After the driver installation process is complete, a confirmation screen appears (**Figure 7-30**).

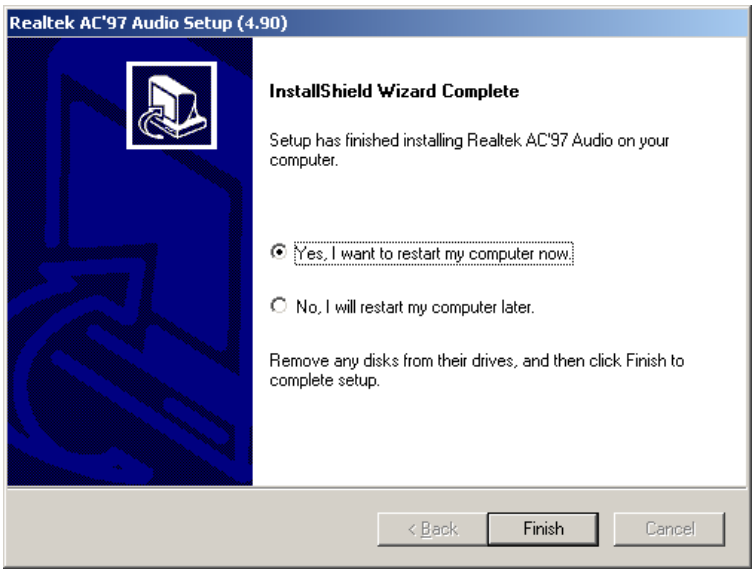
Realtek AC'97 Audio Setup (4.90)
InstallShield Wizard Complete
Setup has finished installing Realtek AC'97 Audio on your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

Figure 7-30: Restart the Computer

Step 12: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.7 Realtek HD Audio Driver (ALC883) Installation

To install the Realtek High Definition (HD) Audio driver, please follow the steps below.

7.7.1 BIOS Setup

Step 1: Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

Step 2: Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [Azalia].

Step 3: Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.7.2 Driver Installation

The Realtek HD Audio Driver (ALC883) installation is similar to the Realtek AC`97 Audio Driver (ALC665) installation. Refer to **Section 7.6.2** for installation details.

7.8 SATA RAID Driver

To install the Intel® Matrix Storage Manager driver, please follow the steps below:

Step 1: Select SATA from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-31**).

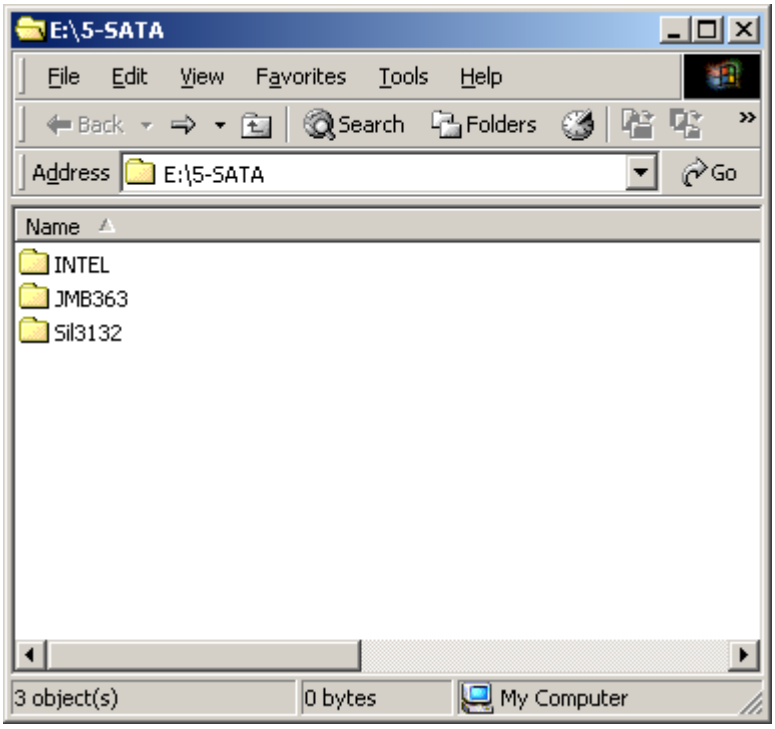

Figure 7-31: SATA RAID Driver Installation Program

Step 3: Double-click the **INTEL** folder.

Step 4: Double-click the **iata62_cd.exe** program icon in **Figure 7-32**.

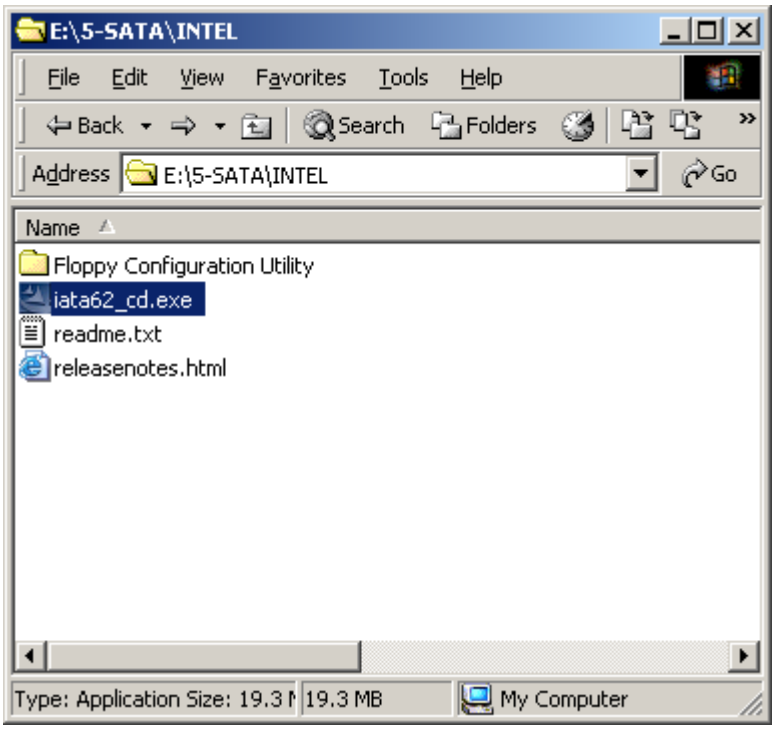

Figure 7-32: SATA RAID Setup Program Icon

Step 5: **Figure 7-33** shows the **InstallShield Wizard** preparing to guide the user through the rest of the process.

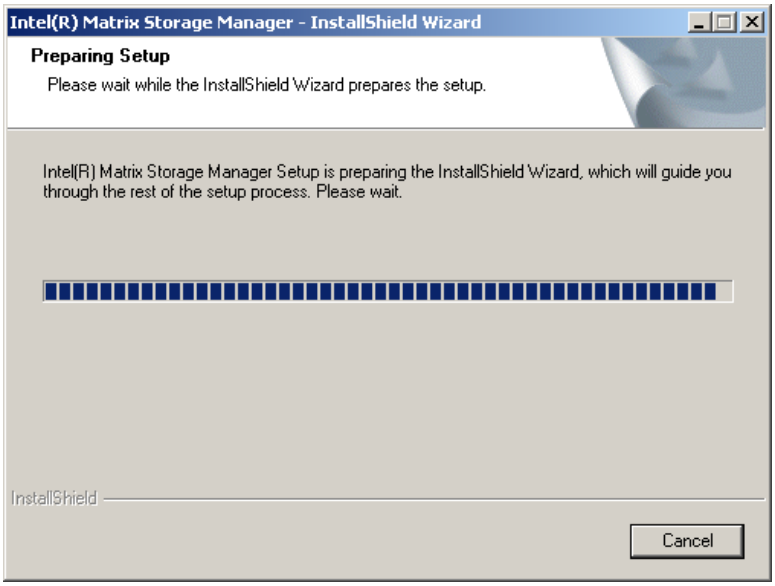
Intel(R) Matrix Storage Manager - InstallShield Wizard
Preparing Setup
Please wait while the InstallShield Wizard prepares the setup.
Intel(R) Matrix Storage Manager Setup is preparing the InstallShield Wizard, which will guide you through the rest of the setup process. Please wait.
InstallShield
Cancel

Figure 7-33: InstallShield Wizard Setup Screen

Step 6: **Figure 7-34** shows the **Matrix Storage Manager** software configuring the installation process.

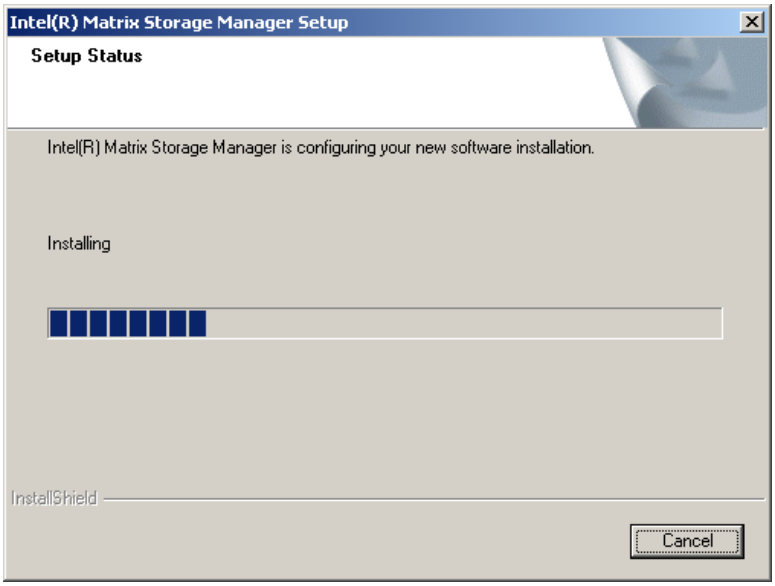

Figure 7-34: Matrix Storage Manager Setup Screen

Step 7: **Figure 7-35** shows the **Matrix Storage Manager** welcome screen.

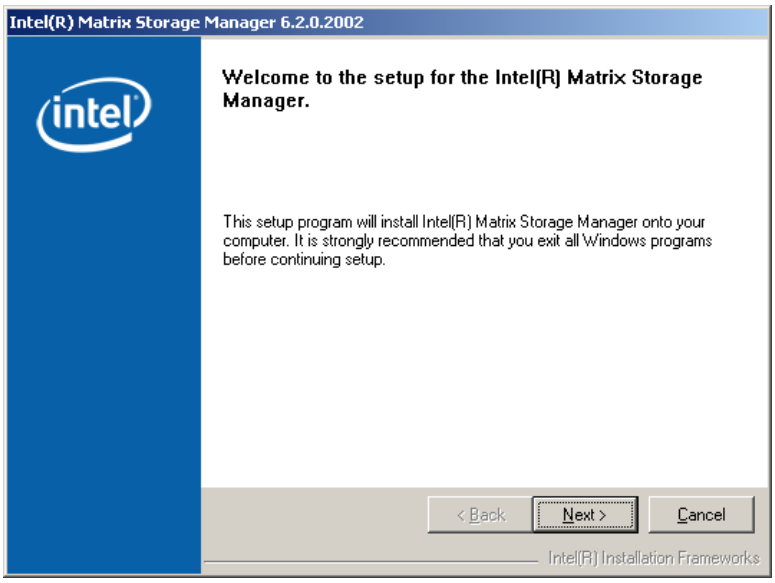
Intel(R) Matrix Storage Manager 6.2.0.2002
Welcome to the setup for the Intel(R) Matrix Storage Manager.
This setup program will install Intel(R) Matrix Storage Manager onto your computer. It is strongly recommended that you exit all Windows programs before continuing setup.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-35: Matrix Storage Manager Welcome Screen

Step 8: Click **NEXT** and a warning appears (**Figure 7-36**). Read the warning carefully and decide whether or not to continue the installation process.

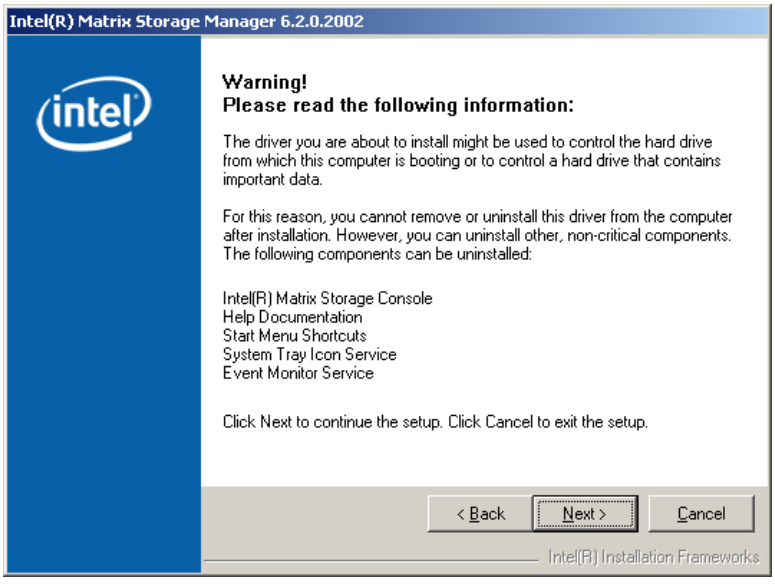
Intel(R) Matrix Storage Manager 6.2.0.2002
Warning!
Please read the following information:
The driver you are about to install might be used to control the hard drive from which this computer is booting or to control a hard drive that contains important data.
For this reason, you cannot remove or uninstall this driver from the computer after installation. However, you can uninstall other, non-critical components. The following components can be uninstalled:
Intel(R) Matrix Storage Console
Help Documentation
Start Menu Shortcuts
System Tray Icon Service
Event Monitor Service
Click Next to continue the setup. Click Cancel to exit the setup.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-36: Matrix Storage Manager Warning Screen

Step 9: Click **NEXT** and a license agreement appears (**Figure 7-37**).

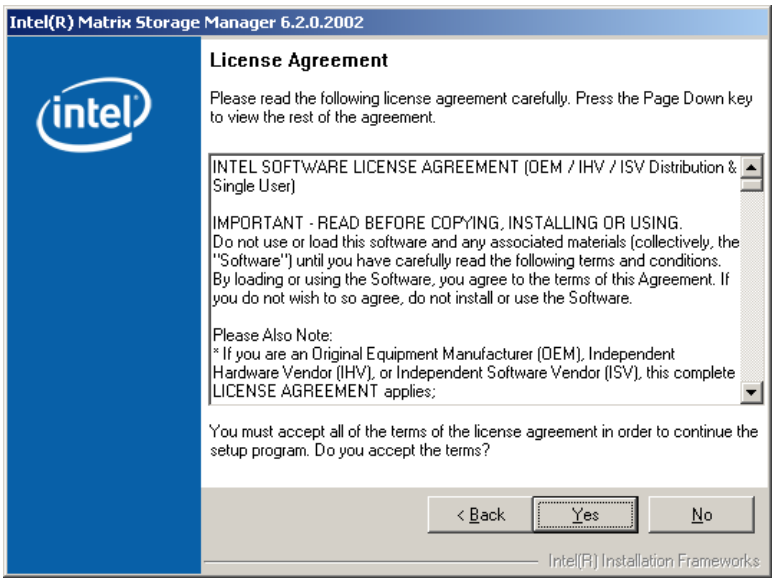
Intel(R) Matrix Storage Manager 6.2.0.2002
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-37: Matrix Storage Manager License Agreement

Step 10: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the Readme information file shown in **Figure 7-38** appears.

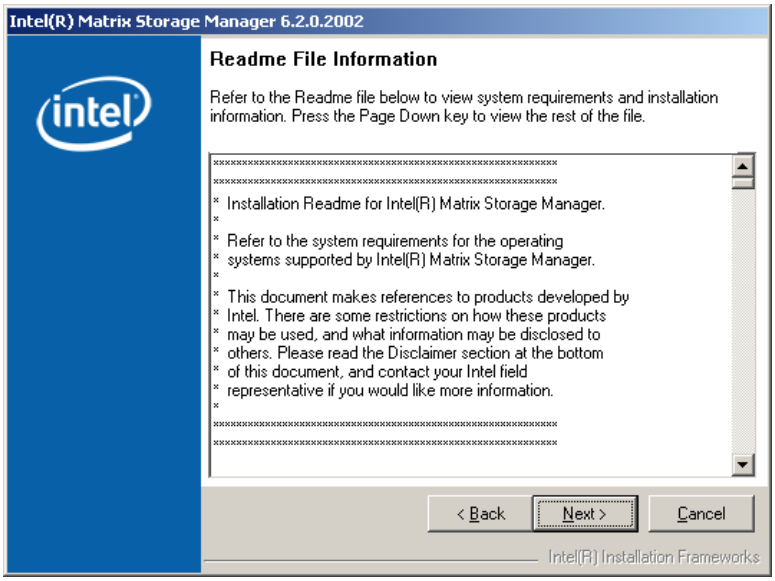
Intel(R) Matrix Storage Manager 6.2.0.2002
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
Installation Readme for Intel(R) Matrix Storage Manager.
Refer to the system requirements for the operating systems supported by Intel(R) Matrix Storage Manager.
This document makes references to products developed by Intel. There are some restrictions on how these products may be used, and what information may be disclosed to others. Please read the Disclaimer section at the bottom of this document, and contact your Intel field representative if you would like more information.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-38: Matrix Storage Manager Readme File

Step 11: Read the Readme file information and click **NEXT**.

Step 12: After the driver installation process is complete, a confirmation screen appears (**Figure 7-39**).

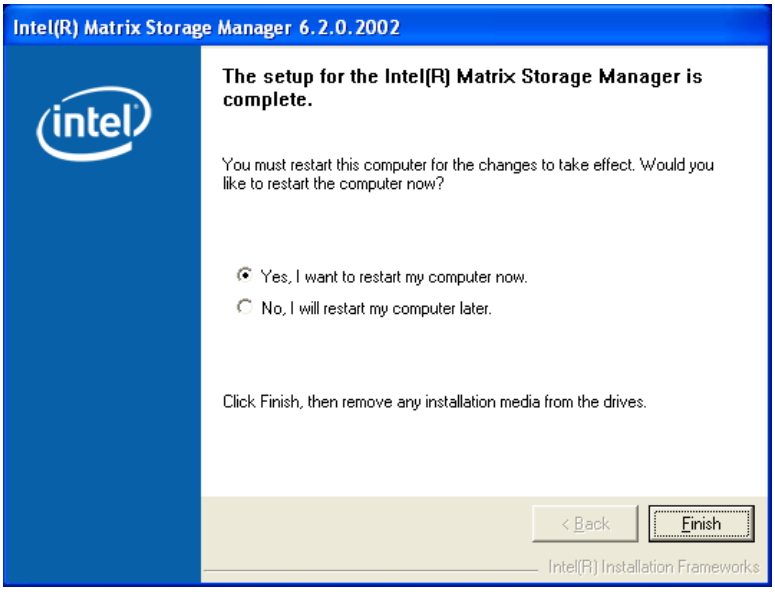
Intel(R) Matrix Storage Manager 6.2.0.2002
The setup for the Intel(R) Matrix Storage Manager is complete.
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Click Finish, then remove any installation media from the drives.
< Back
Finish
Intel(R) Installation Frameworks

Figure 7-39: Matrix Storage Manager Setup Complete

Step 13: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.9 IDE Controller Installation

To install the IDE controller, please follow the steps below.

Step 1: Open **Windows Control Panel** (**Figure 7-40**).

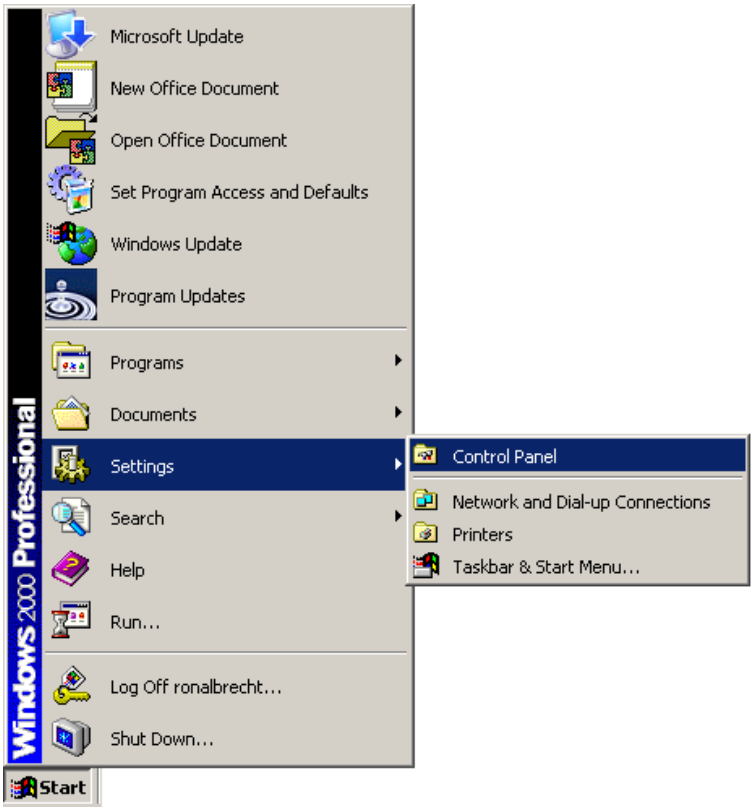

Figure 7-40: Access Windows Control Panel

Step 2: Double-click the **System** icon (**Figure 7-41**).

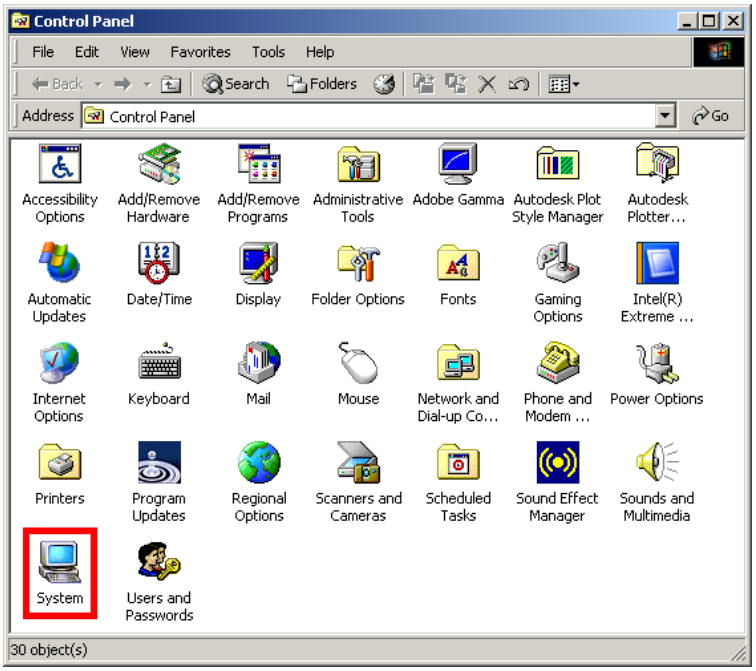

Figure 7-41: Double Click the System Icon

Step 3: Double-click the **Device Manager** tab (**Figure 7-42**).

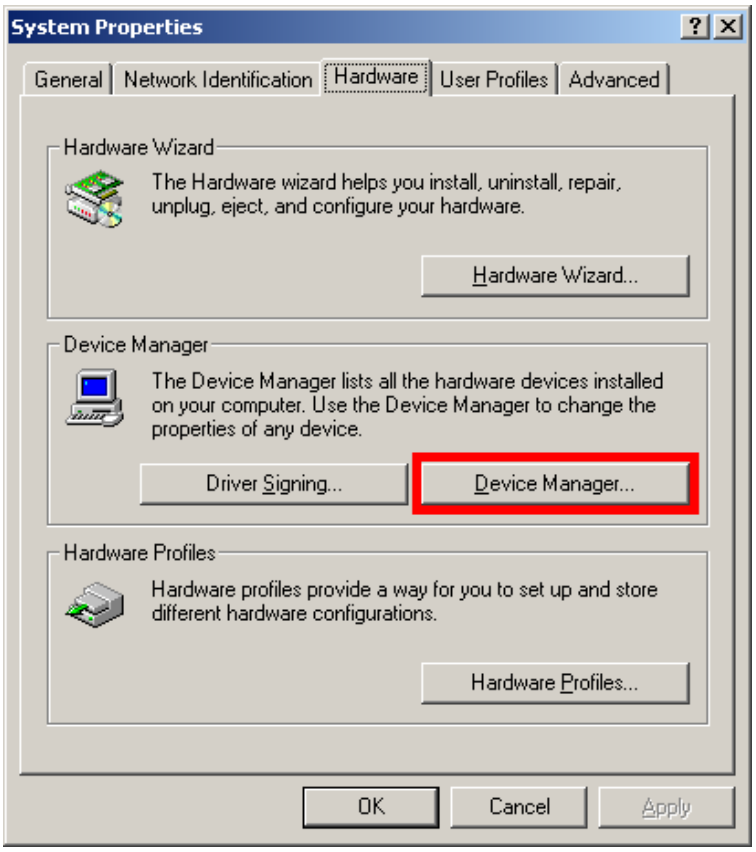
System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

Figure 7-42: Double Click the Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 7-43**).

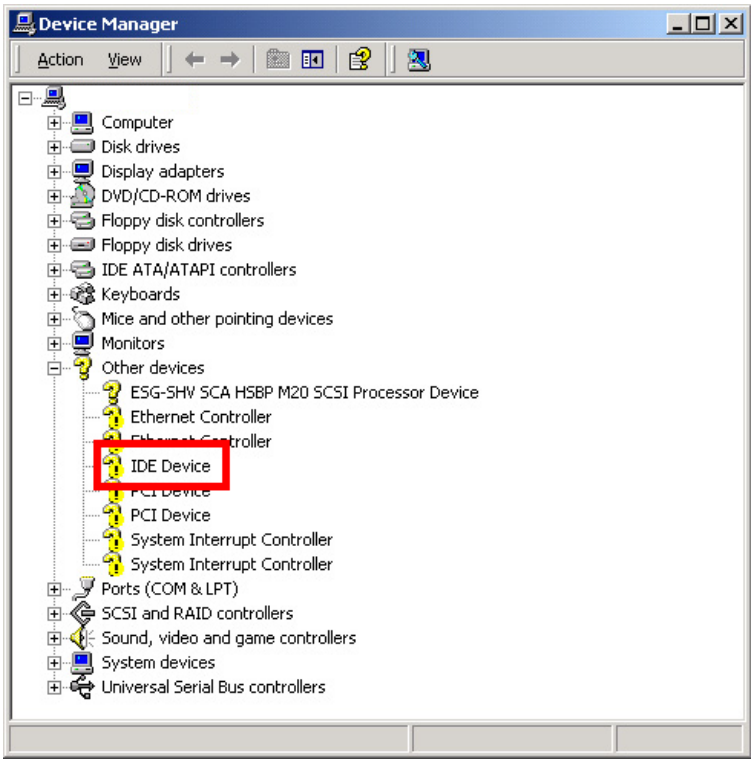

Figure 7-43: Device Manager List

Step 5: Double-click the listed device that has question marks next to it. (This means Windows does not recognize the device).

Step 6: The **Device Driver Wizard** appears (**Figure 7-44**). Click **NEXT** to continue.

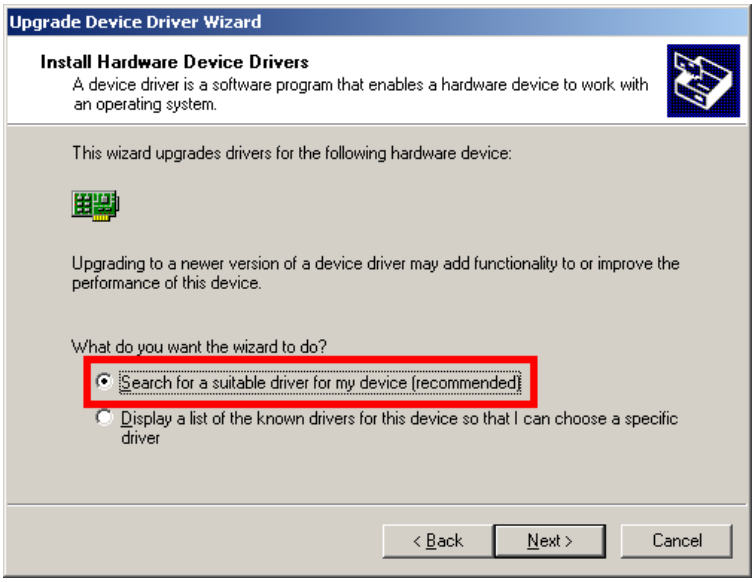
Upgrade Device Driver Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard upgrades drivers for the following hardware device:
Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

Figure 7-44: Search for Suitable Driver

Step 7: Select "**Specify a Location**" in the **Locate Driver Files** window (**Figure 7-45**).

Click **NEXT** to continue.

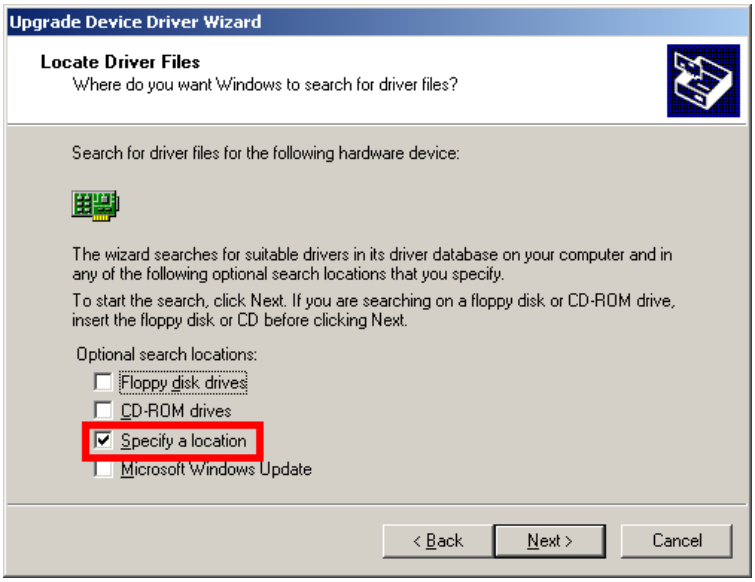
Upgrade Device Driver Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

Figure 7-45: Locate Driver Files

Step 8: Select the proper OS folder under the "**X:\7-IDE\IT8211 v1.3.2.8**" directory (**Figure 7-46**) in the location browsing window, where "**X:\"** is the system CD drive.

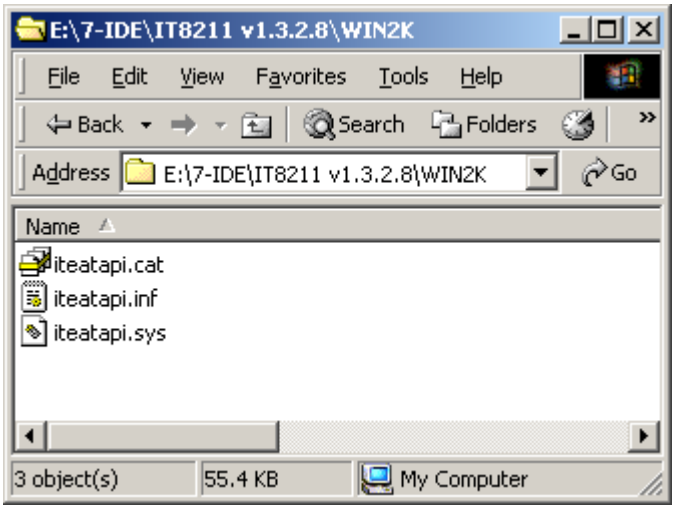

Figure 7-46: Location Browsing Window

Step 9: Click **OK** to continue. A driver files location menu window appears. Click **NEXT** to continue. The driver is installed.

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Appendix

A

BIOS Menu Options

A.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 6**.

- ➔ **System Overview** **84**
- ➔ **System Time [xx:xx:xx]** **84**
- ➔ **System Date [xx/xx/xx]** **85**
- ➔ **ATA/IDE Configurations [Compatible]** **88**
- ➔ **Legacy IDE Channels [PATA Pri, SATA Sec]** **89**
- ➔ **IDE Master and IDE Slave** **89**
- ➔ **Auto-Detected Drive Parameters** **90**
- ➔ **Type [Auto]** **91**
- ➔ **ZIP** **91**
- ➔ **LS-120** **91**
- ➔ **LBA/Large Mode [Auto]** **91**
- ➔ **Block (Multi Sector Transfer) [Auto]** **92**
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Appendix

B

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table B-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE       W_LOOP        ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

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Appendix

C

Address Mapping

C.1 IO Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	SiS661CX Graphics Controller
3C0-3DF	SiS661CX Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table C-1: IO Address Map

C.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table C-2: 1st MB Memory Address Map

C.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table C-3: IRQ Mapping Table

C.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table C-4: IRQ Mapping Table

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Appendix

D

DIO Interface

D.1 DIO Interface Introduction

The DIO connector on the PCIE-9450 is interfaced to GPIO ports on the Winbond Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the Winbond Super I/O chipset.

D.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 0	GP14	General purpose I/O port 1 bit 4.
4	Output 1	GP15	General purpose I/O port 1 bit 5.
5	Output 2	GP16	General purpose I/O port 1 bit 6.
6	Output 3	GP17	General purpose I/O port 1 bit 7.
7	Input 0	GP10	General purpose I/O port 1 bit 0.
8	Input 1	GP11	General purpose I/O port 1 bit 1
9	Input 2	GP12	General purpose I/O port 1 bit 2
10	Input 3	GP13	General purpose I/O port 1 bit 3

D.3 Assembly Language Samples

D.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

```
MOV     AX, 6F08H       Sets the digital port as input
INT     15H             Initiates the INT 15H BIOS call
```

D.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

```
MOV     AX, 6F09H       Sets the digital port as output
MOV     BL, 09H
INT     15H             Initiates the INT 15H BIOS call
```

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Appendix

E

External AC'97 Audio CODEC

E.1 Introduction

The motherboard comes with an onboard Realtek ALC850 CODEC. Realtek ALC850 is a AC'97 2.3 compatible stereo audio CODEC with a variable sampling rate and four 16-bit two-channel DACs and a stereo 16-bit ADC.

E.1.1 Accessing the AC'97 CODEC

The CODEC is accessed through the six phone jacks on the rear panel of the motherboard. The phone jacks include:

- LINE IN
- LINE OUT
- MIC IN
- WOOFER
- REAR SPEAKER
- SIDE SPEAKER

E.1.2 Driver Installation

The driver installation has been described in **Section 7.6**.

After rebooting, the sound effect configuration utility appears in the **Windows Control Panel** (**Figure E-1**). If the peripheral speakers are properly connected, sound effects should be heard.

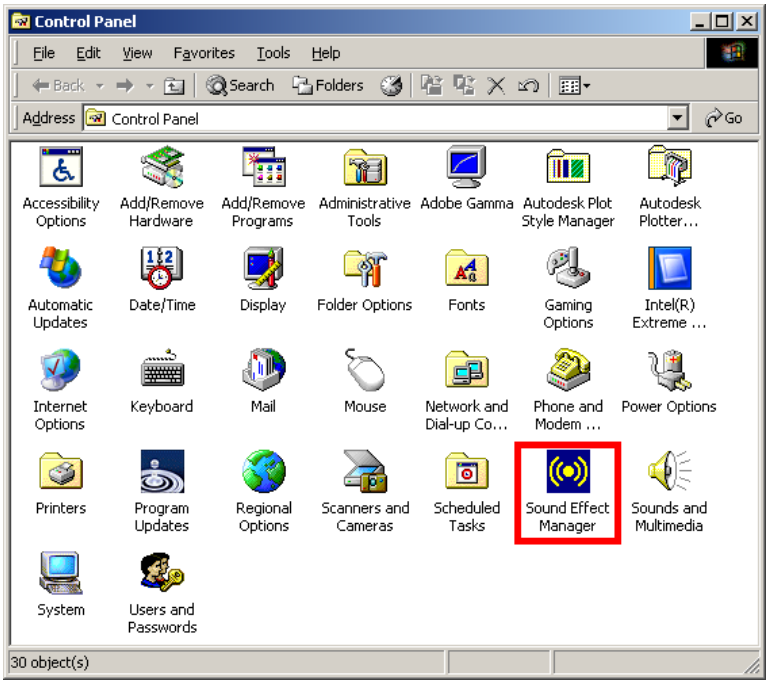

Figure E-1: Control Panel Sound Effect Manager

E.2 Sound Effect Configuration

E.2.1 Accessing the Sound Effects Manager

To access the **Sound Effect Manager**, please do the following:

Step 1: Install the ALC850 audio CODEC driver.

Step 2: Click the **Sound Effect Manager** icon in the system task bar (**Figure E-2**).

Figure E-2: Sound Effect Manager Icon [Task Bar]

Step 3: The sound effect manager appears (**Figure E-3**).

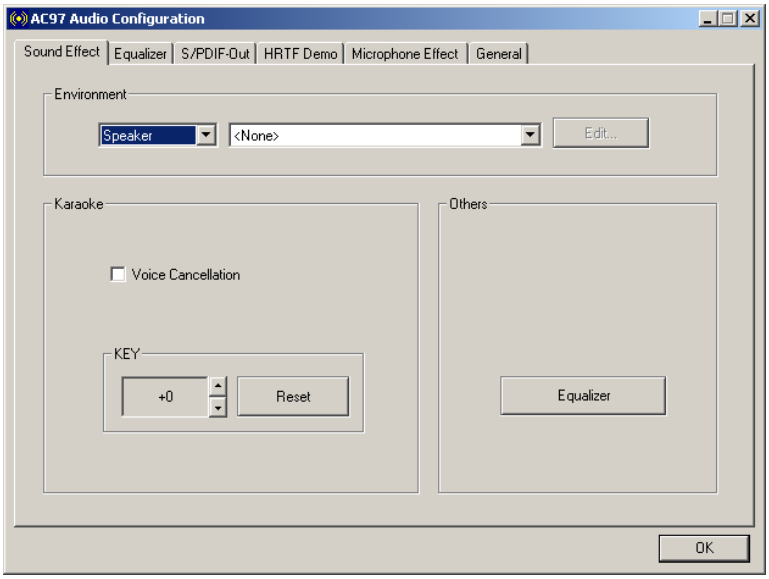

Figure E-3: Sound Effects Manager (ALC850)

NOTE:

The Sound Effect Manager shown in **Figure E-3** is for the RealTek ALC850 audio CODEC. Different CODECs may have different sound manager appearances.

The following section describes the different configuration options in the Sound Effect Manager.

E.2.2 Sound Effect Manager Configuration Options

The **Sound Effects Manager** enables configuration of the items listed below. To configure these items click the corresponding menu tab in the **Sound Effects Manager** (**Figure E-3)**.

NOTE:

The Karaoke Mode is configured in the Sound Effect menu. To access Karaoke configuration settings, click on the Sound Effect menu tab.

- Sound Effect
- Karaoke Mode
- Equalizer
- Speaker Configuration
- Speaker Test
- S/PDIF-In
- S/PDIF-Out
- Connector Sensing
- HRTF Demo
- Microphone Effect
- General

NOTE:

Not all RealTek Sound Effect Managers have all the above listed options. The Sound Effect Manager loaded onto the system may only have some of the options listed above.

Below is a brief description of the available configuration options in the **Sound Effects Manager**.

- ***Sound Effect*** - Select a sound effect from the 23 listed options in the drop down menu. Selected sound effect properties can be edited. To edit the sound effect click **EDIT**.
- ***Karaoke Mode*** - The **Karaoke Mode** is accessed in the Sound Effect tab. The **Voice Cancellation** disables the vocal part of the music being played.

The **Key adjustment** up or down arrow icons enables users to define a key that fits a certain vocal range.

- ***Equalizer Selection*** - Preset equalizer settings enable easy audio range settings. Ten frequency bands can be configured.
- ***Speaker Configuration*** - Multi-channel speaker settings are configured in this menu. Configurable options include:
  - Headphone
  - Channel mode for stereo speaker output
  - Channel mode for 4 speaker output
  - Channel mode for 5.1 speaker output
  - Synchronize the phonejack switch with speakers settings
- ***Speaker Test*** - Each speaker connected to the system is tested individually to see if the 4-channel or 6-channel audio operates properly.
- ***S/PDIF-In & S/PDIF-Out*** - S/PDIF is used to transmit digital and analog audio signals with either a 48 or 44.1kHz sample rate.
- ***HRTF Demo*** - Adjust HRTF (Head Related Transfer Functions) 3D positional audio here before running 3D applications.
- ***Microphone Effect*** - Microphone noise suppression is enabled in this menu.
- ***General*** - General information about the installed AC'97 audio configuration utility is listed here.

Appendix

F

Intel® Matrix Storage Manager

F.1 Introduction

The Intel® ICH7R chipset can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.

CAUTION!

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

F.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.

WARNING!

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

F.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003 and Windows Vista

F.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

Step 4: **Connect SATA drives to the system**. Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 5: **Enable SATA drives in BIOS**. Start the computer and access the **BIOS** setup program. Enable **SATA** support for all IDE devices. Refer to the applicable BIOS configuration section in this user manual.

Step 6: **Save and Exit BIOS**. After the **SATA** support option is enabled, save and exit the **BIOS**.

Step 7: **Reboot the system**. Reboot the system after saving and exiting the **BIOS**.

Step 8: **Press Ctrl+I**. During the system boot process, press **Ctrl+I** when prompted to enter the RAID configuration software.

Step 9: **Configure the RAID settings**. Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.

Step 10: **Install the OS**. After the RAID array has been configured, install the OS. To do this, please refer to the documentation that came with the OS.

F.4 RAID Configuration

F.4.1 Creating a RAID Volume

WARNING!

All data previously stored on the member drives of a RAID configuration are destroyed during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: **Select** "**Create RAID Volume**." Use the arrow keys to highlight **Create RAID Volume** and press **ENTER**. See Figure F-1.

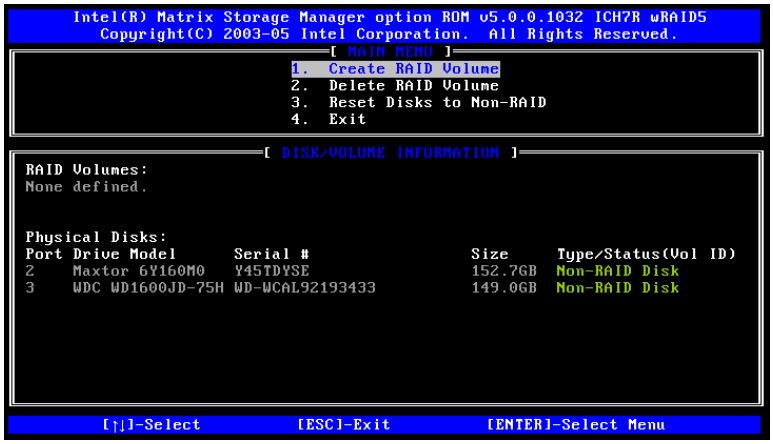
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
None defined.
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Non-RAID Disk
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure F-1: Matrix Storage Manager Main Menu

Step 2: **Name the RAID volume**. Enter a name for the RAID volume, or press **ENTER** to accept the default volume name. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array. See Figure F-2.

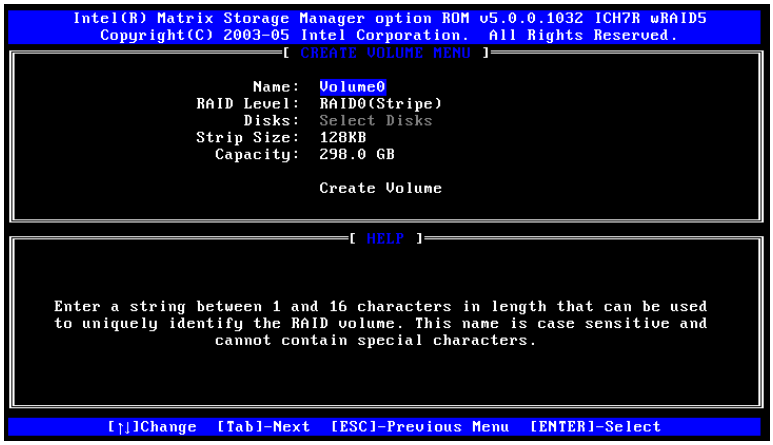
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and cannot contain special characters.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure F-2: Create RAID Volume Name

Step 3: **Choose the RAID level**. Select a RAID level from the list. RAID levels include RAID 0, 1, 5 and 10. See Figure F-3.

NOTE:

RAID 0 and RAID1 levels require a minimum of two hard drives.

RAID 10 level requires a minimum of four hard drives.

RAID5 level requires a minimum of three hard drives.

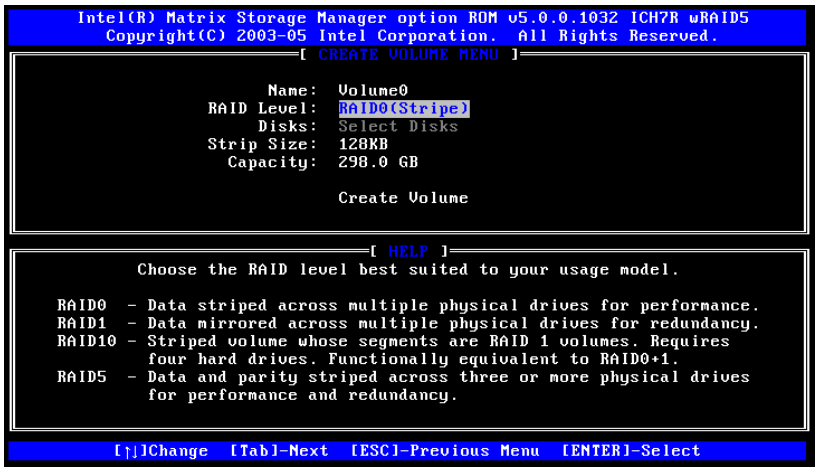
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Choose the RAID level best suited to your usage model.
RAID0 - Data striped across multiple physical drives for performance.
RAID1 - Data mirrored across multiple physical drives for redundancy.
RAID10 - Striped volume whose segments are RAID 1 volumes. Requires four hard drives. Functionally equivalent to RAID0+1.
RAID5 - Data and parity striped across three or more physical drives for performance and redundancy.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure F-3: Choose the Raid Level

Step 4: **Select the Stripe Size**. Select a stripe size from the list. See Figure F-4.

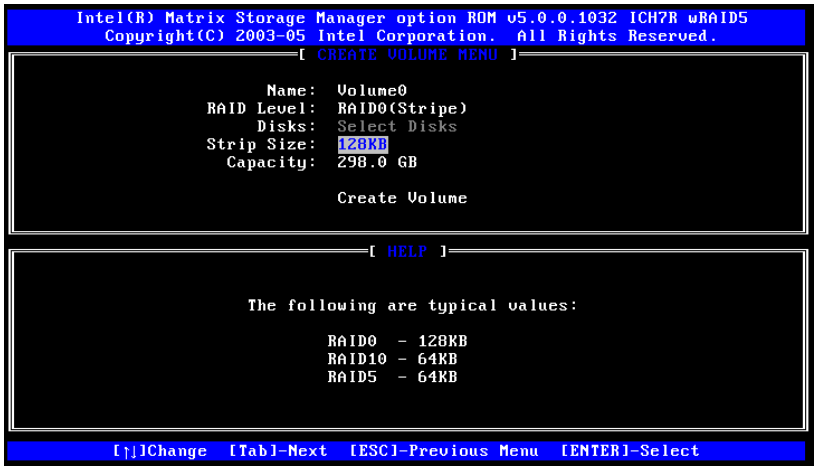

Figure F-4: Select the Stripe Size

Step 5: **Enter the Volume Capacity**. Enter the volume capacity, or press **ENTER** to accept the default capacity. See Figure F-5.

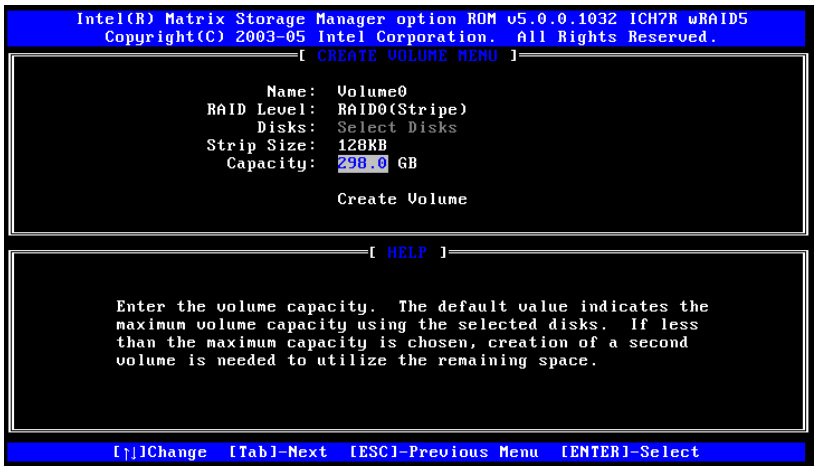
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Enter the volume capacity. The default value indicates the maximum volume capacity using the selected disks. If less than the maximum capacity is chosen, creation of a second volume is needed to utilize the remaining space.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure F-5: Enter the Volume Capacity

Step 6: **Create the RAID Volume**. Press **ENTER** to create the RAID volume as specified.

See Figure F-6.

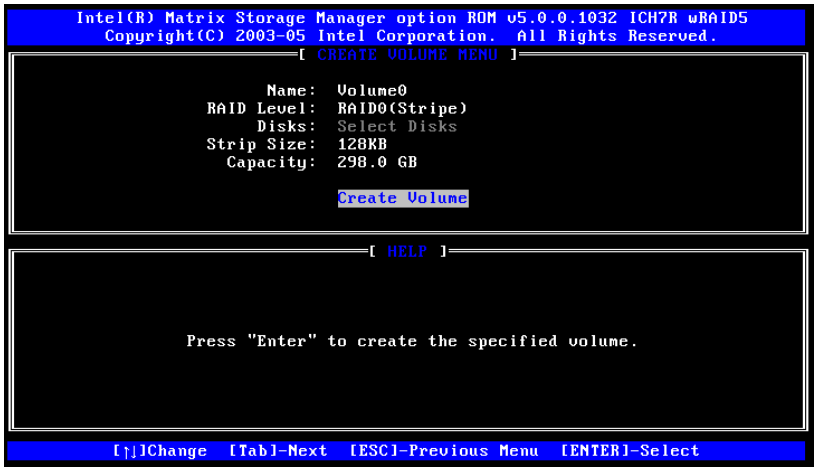
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
Create Volume
[HELP]
Press "Enter" to create the specified volume.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure F-6: Create the RAID Volume

Step 7: **Create RAID Volume Verification**. After reading the warning, press **Y** to create the RAID volume as specified, or **N** to return to the **Create RAID Volume** menu.

See Figure F-7.

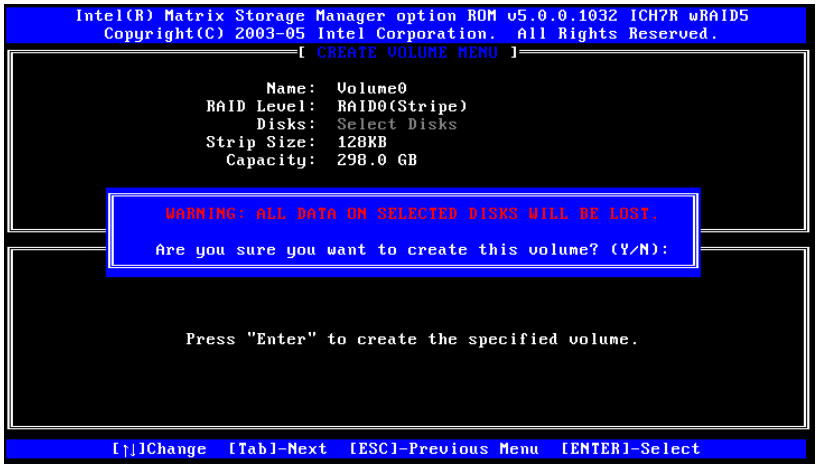
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volume0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 298.0 GB
WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.
Are you sure you want to create this volume? (Y/N):
Press "Enter" to create the specified volume.
[↑↓]Change [Tab]-Next [ESC]-Previous Menu [ENTER]-Select

Figure F-7: Create RAID Volume Verification

F.4.2 Deleting a RAID Volume

WARNING!

All data stored on the member drives of a RAID volume are destroyed during the RAID deletion process. Make sure any data to be saved has been moved or backed up before deleting a RAID volume.

Step 1: **Select** "**Delete RAID Volume**." Use the arrow keys to highlight **Delete RAID Volume** and press **ENTER**. See Figure F-8.

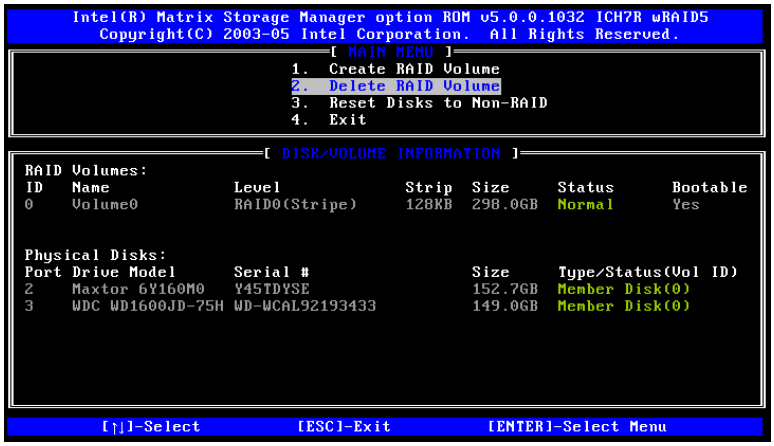
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Normal Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk(0)
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure F-8: Delete RAID Volume Menu

Step 2: **Select RAID Volume to be Deleted**. Use the arrow keys to highlight the RAID volume to be deleted and press **ENTER**. See Figure F-9.

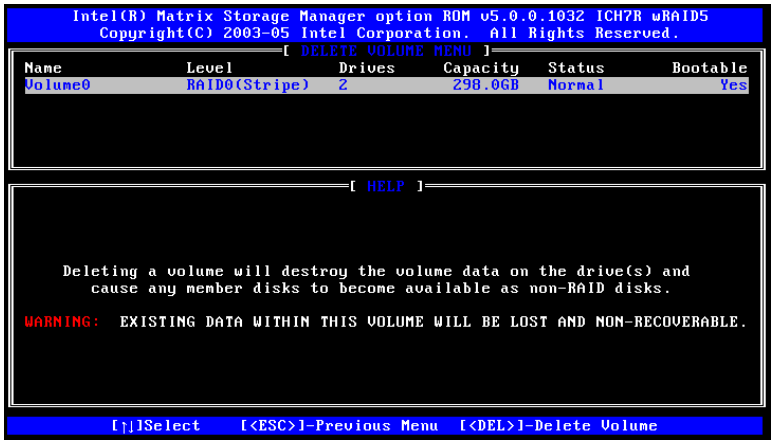
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[DELETE VOLUME MENU]
Name Level Drives Capacity Status Bootable
Volume0 RAID0(Stripe) 2 298.0GB Normal Yes
[HELP]
Deleting a volume will destroy the volume data on the drive(s) and cause any member disks to become available as non-RAID disks.
WARNING: EXISTING DATA WITHIN THIS VOLUME WILL BE LOST AND NON-RECOVERABLE.
[↑↓]Select [<ESC>]-Previous Menu [<DEL>]-Delete Volume

Figure F-9: Select RAID Volume to be Deleted

Step 3: **Delete Volume Verification**. After reading the warning, press **Y** to delete the specified RAID volume, or **N** to return to the **Delete Volume** menu.

See Figure F-10.

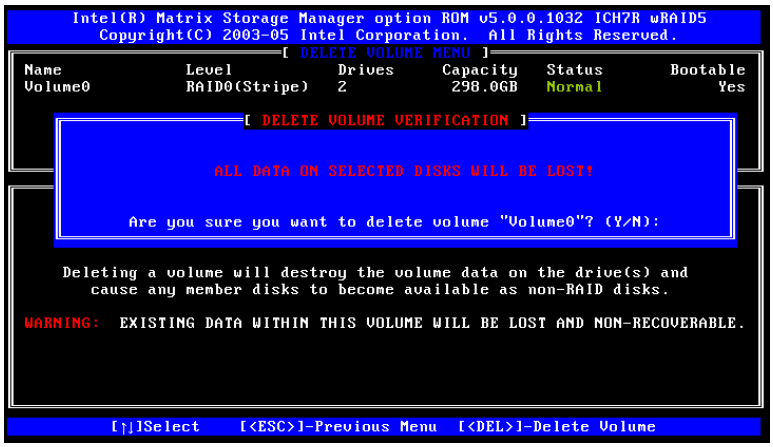
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[DELETE VOLUME MENU]
Name Level Drives Capacity Status Bootable
Volume0 RAID0(Stripe) 2 298.0GB Normal Yes
[DELETE VOLUME VERIFICATION]
ALL DATA ON SELECTED DISKS WILL BE LOST!
Are you sure you want to delete volume "Volume0"? (Y/N):
Deleting a volume will destroy the volume data on the drive(s) and cause any member disks to become available as non-RAID disks.
WARNING: EXISTING DATA WITHIN THIS VOLUME WILL BE LOST AND NON-RECOVERABLE.
[↑↓]Select [<ESC>]-Previous Menu [<DEL>]-Delete Volume

Figure F-10: Delete Volume Verification

Step 4: **Non-RAID Disks**. After deleting the RAID volume, the disks belonging to the volume will be shown as non-RAID disks. See Figure F-11.

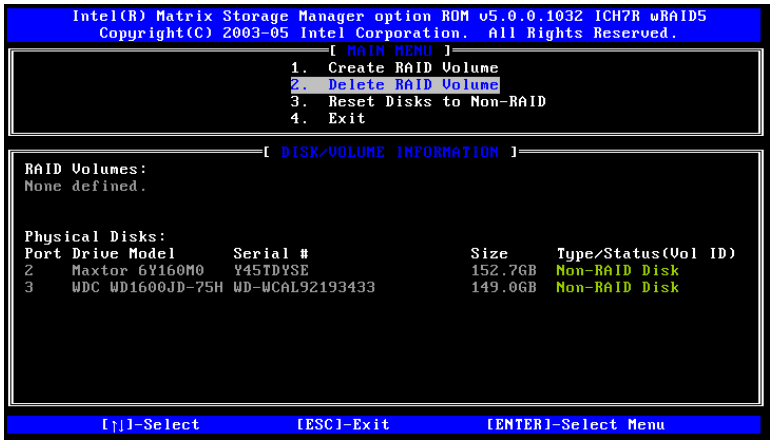
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
None defined.
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Non-RAID Disk
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure F-11: Non-RAID Disks

F.4.3 Resetting a Disk to Non-RAID

WARNING!

All data stored on the disk drive of a RAID volume is destroyed when resetting it to non-RAID. Make sure any data to be saved has been moved or backed up before resetting a disk to non-RAID.

Step 1: **Select** "**Reset Disk to Non-RAID**." Use the arrow keys to highlight **Reset Disk to Non-RAID** and press **ENTER**. See Figure F-12.

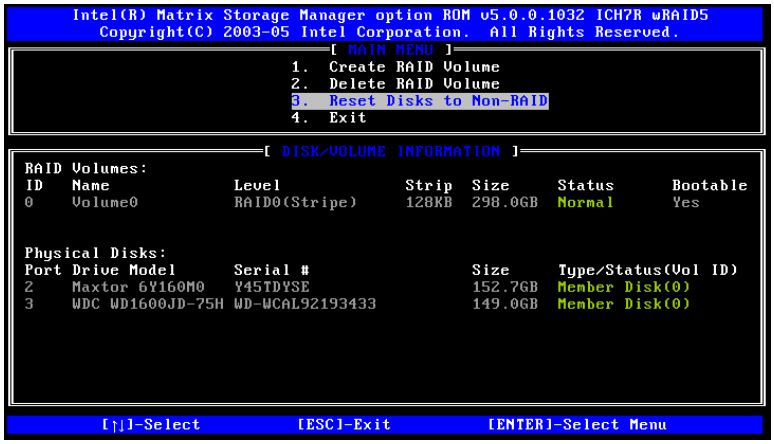
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Normal Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk(0)
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure F-12: Reset Disk to Non-RAID Menu

Step 2: **Select Disks to Reset**. Use the arrow keys to scroll through the disk drives and press **SPACE** to select which drives are to be reset as non-RAID. After all the disks to be reset have been chosen, press **ENTER**. See Figure F-13.

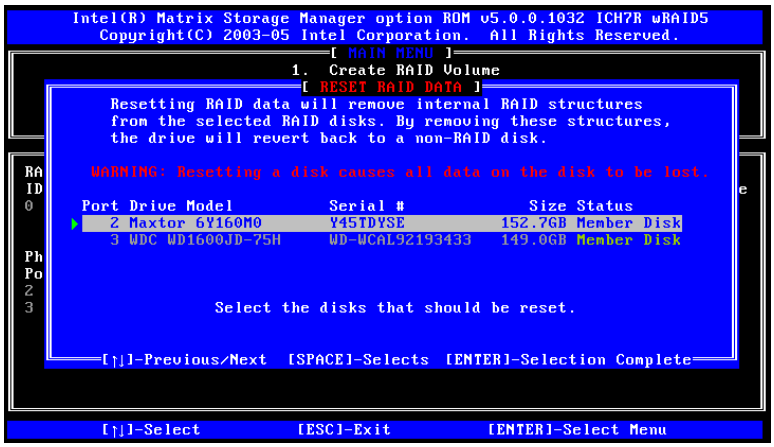
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
[RESET RAID DATA]
Resetting RAID data will remove internal RAID structures
from the selected RAID disks. By removing these structures,
the drive will revert back to a non-RAID disk.
WARNING: Resetting a disk causes all data on the disk to be lost.
Port Drive Model Serial # Size Status
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk
Select the disks that should be reset.
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure F-13: Select Disk to Reset

Step 3: **Reset Disk Verification**. After reading the warning, press **Y** to reset the selected disks as non-RAID, or **N** to return to the **Reset RAID Data** menu. See Figure F-14.

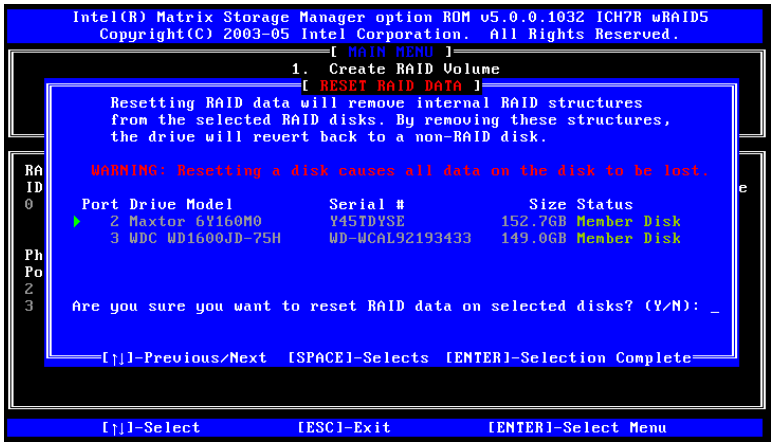
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
[RESET RAID DATA]
Resetting RAID data will remove internal RAID structures
from the selected RAID disks. By removing these structures,
the drive will revert back to a non-RAID disk.
WARNING: Resetting a disk causes all data on the disk to be lost.
Port Drive Model Serial # Size Status
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Member Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk
Are you sure you want to reset RAID data on selected disks? (Y/N): _
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure F-14: Reset Disk Verification

Step 4: **Disk Drive and RAID Volume Status**. After the disk drives have been reset, the **Matrix Storage Manager Main** menu is shown indicating the status of the RAID volumes and disk drives. See Figure F-15.

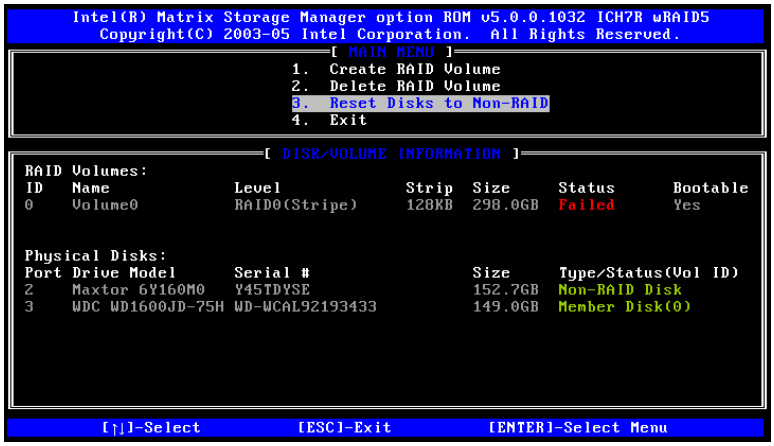
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Failed Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure F-15: Disk Drive and RAID Volume Status

F.4.4 Exiting the Matrix Storage Manager

Step 1: **Select** "**Exit**." Use the arrow keys to highlight **Exit** and press **ENTER**.

See Figure F-16.

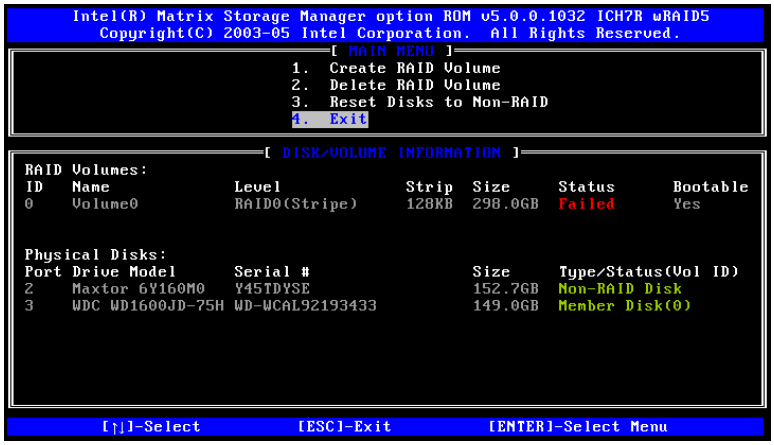
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
RAID Volumes:
ID Name Level Strip Size Status Bootable
0 Volume0 RAID0(Stripe) 128KB 298.0GB Failed Yes
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
2 Maxtor 6Y160M0 Y45TDYSE 152.7GB Non-RAID Disk
3 WDC WD1600JD-75H WD-WCAL92193433 149.0GB Member Disk(0)
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure F-16: Exit Menu

Step 2: **Exit Verification**. Press **Y** to exit the **Matrix Storage Manager**, or **N** to return to the **Main** menu. See Figure F-17.

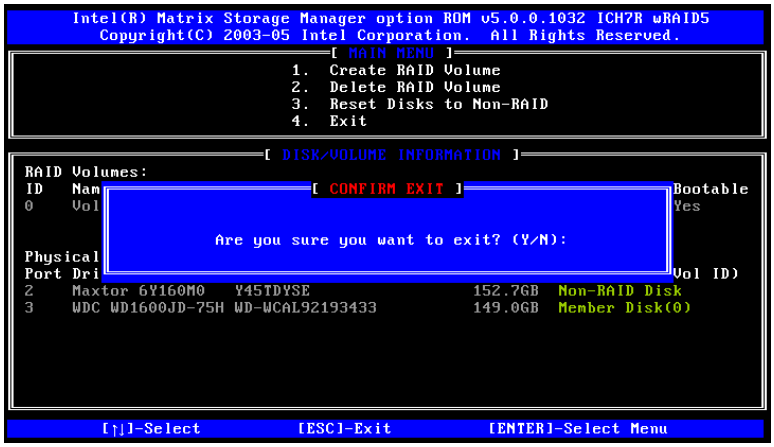
Intel(R) Matrix Storage Manager option ROM v5.0.0.1032 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disks to Non-RAID
4. Exit
[DISK/VOLUME INFORMATION]
[CONFIRM EXIT]
Are you sure you want to exit? (Y/N):
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

Figure F-17: Exit Verification

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